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LANDSCAPE MANAGEMENT

SERVING GOLF AND LANDSCAPE PROFESSIONALS

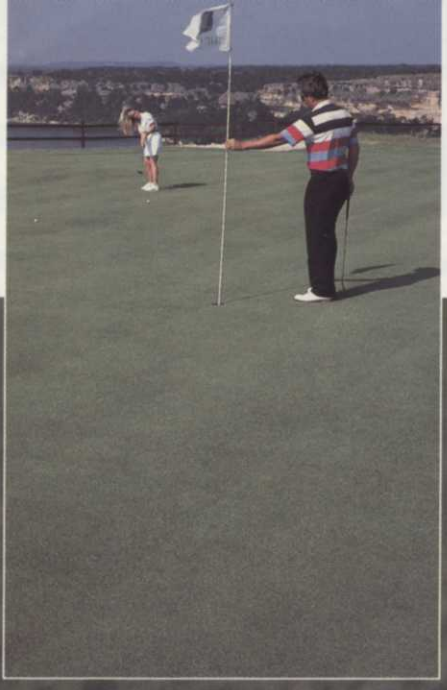
LIQUID OR DRY FERTILIZER IN LAWN CARE?

also...

Late-Season Fertilization

Getting Good Grub Control

What's Up In Seed Country?



PennLinks®

is on top of it all at The Cliffs

"Things are bigger here in Possum Kingdom, Texas. For instance, our 180,000 square feet of PennLinks greens that perform flawlessly in our extremes of heat, humidity and cold.

"We hand mow our greens at 3/16". The longer cut stresses the plant less, and promotes deeper, healthier roots. With PennLinks' upright growth habit, there's no need to mow shorter for a 'true' putt and the leaf length helps hold the ball on our extremely contoured greens.

"We realize a substantial monetary and labor savings with PennLinks. Its strong root system requires less syringing; we verticut and topdress only twice yearly, and have not had to apply any preventive fungicide since seeding in the spring of 1987.

"PennLinks also shows quick recovery from Texas-type trials like drought, water loss for 3-4 days, 2 inch hailstones, pythium and deer damage.

"I feel any superintendent who looks at all available bents with an open mind, and does his homework as I have, will choose PennLinks over any other. That's why PennLinks is on top at The Cliffs."

Randy Thompson, CGCS
Director of Golf and Course Management
The Cliffs, Possum Kingdom, TX

A von Hagge and Assoc. designed course
Developed by Sheffield Management Co.

Fallon, Randy and Lisa Thompson

"I like PennLinks because it's easy to live with... my family likes PennLinks because I'm easier to live with."

Randy Thompson

In the exclusive "Penn Pail"

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1-800-547-0255

Circle No. 131 on Reader Inquiry Card

AUGUST 1990, VOLUME 29, NUMBER 8

LANDSCAPE MANAGEMENT®

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POSTMASTER: Send address changes to LANDSCAPE MANAGEMENT, P.O. Box 6198, Duluth, Minnesota 55806.

1200

They're ready on the beaches for the 1991 U.S. Open assault

Narrow fairways, long rough, strategic bunkers and lightning-fast greens. Welcome to the U.S. Open—the toughest major test in golf.

Preparing a course for this kind of battle is no easier than playing it. It takes years of hard work. Fortunately, Certified Golf Course Superintendent Chris Hague and Minnesota's Hazeltine National—site of the 1991 U.S. Open—have been there before.

"I've been here since 1982," says Hague, "and the club has prepared for two U.S. Women's Opens, the PGA Grand Slam and the U.S. Seniors Open since hosting its first U.S. Open in 1970.

"Our John Deere equipment has been a big help this time around. I've got 15 John Deere machines that we've used in everything from course reconstruction to daily maintenance.

"The new 1200 Bunker and Field Rake has been a very pleasant surprise. We've found that it does a better job and is physically easier to operate than other machines we've tried. The style of the rake fits with our plan to keep firm, smooth bunkers. In fact, it's done such a good job that it was the only machine we allowed in our bunkers all last year."

For the name of your nearest distributor, or free literature on all John Deere Golf and Turf Equipment, call 1-800-544-2122 toll free or write John Deere, Dept. 956, Moline, IL 61265. We know, like Chris Hague, you're going to like what you see.

Superintendent Chris Hague depends on a John Deere 1200 Bunker and Field Rake to help groom one of Hazeltine National's more than 100 bunkers for the 1991 U.S. Open.

JOHN DEERE

Nothing Runs Like a Deere®

SAFETY live with it

Circle No. 104 on Reader Inquiry Card

AS I SEE IT...

Do you want what you need?

Magazine editors, politicians and trade association executives: all must deal with constituencies—no easy task in any case.

One of the knotty questions groups like these must eventually answer is, "Do we give our constituents what they *want* or what they *need*?" From an editor's standpoint, our magazine likes to give its readers everything they *want*, and then hope there's room left to squeeze in some of what they *need*. This is exactly what the trade associations have found out.

"One important fact that we have learned the hard way is that you cannot *make* people interested," says ALCA (landscape association) executive director Debra Dennis. "They have to decide they are interested in something for themselves."

Part of what we're referring to here is the ability of an association to lobby for its membership. The green industry, for instance, would do well to counter anti-pesticide lobbying with an effort of its own. But—because there is no immediate, tangible return on effort—most lawn care and landscape companies could care less whether their interests are represented in Washington, D.C.

And this attitude, we at the magazine have found, by and large parallels readership patterns: write an article about how a reader can influence his congressman and he'll flip right past it.

"We don't have a lobbyist and, given the attitude of the members, I don't see that in the future," notes Dennis.

The PLCAA (lawn care association) three years ago increased membership fees to address legislative issues and was immediately tanked (that's "tanked," not "thanked") by some smaller members.

"We spent $350,000 on issues management," recalls current president Rick Steinau. "That was a clear...horrible...message that the association is for large companies. We've covered the national issues, but we haven't attended to member services.

"If I had my druthers, we'd have worked diligently at an insurance program that would knock your socks off. It would offer the smaller companies an immediate return on investment. In effect, it would be a 'no-brainer,' and we need some of those to get the smaller companies into our fold."

Neither trade associations nor trade magazines can be all things to all people. (Neither can politicians, for that matter.) But we'll continue to try.

All the trade associations ask is a chance to help you do business more efficiently and more profitably. You've chosen to receive our magazine. How about giving a trade association a try, too?

Jerry Roche

Jerry Roche, executive editor

LM

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"We chose Triathalawn Tall Fescue for Deer Creek based on National performance trials for our region ...and some sound advice from Williams Lawn Seed."

Larry Hanks, VP Golf Operations; North Star Development Co., Inc. at Deer Creek, Overland Park, KS.

"When planning our World-class, Robert Trent Jones II designed golf course in the Kansas City area, we had to seriously consider our hot, dry summers. We simply could not leave the all-important turf areas to chance. Penncross bent was selected for the greens, zoysia for the tees and fairways, and tons and tons of Triathalawn blend was seeded into the roughs. Our tees, greens and fairways will receive adequate water, but we're counting on Triathalawn's deep-rooting to look good in the unirrigated areas ... especially around our stately trees.

Deer Creek is a privately owned course open for fee play. After observing how tall fescues handled the wear, shade and 1988 drought at neighboring private and public courses, we agreed that the new turf-types were up to the task. When it came to selecting a brand name, we picked Triathalawn blend, to make the *very best* of a *real good* thing."

Triathalawn
Turf-Type Tall Fescue Blend

Produced by TURFSEED®

PO Box 250, Hubbard, OR 97032
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1-800-247-6910

Circle No. 133 on Reader Inquiry Card

How to keep your acres and acres of earth looking like a little slice of heaven.

Adopt a Mobay fungicide program, and start producing turf that's a cut above.

Start with BAYLETON® Turf and Ornamental Fungicide. It has an unequaled reputation for stopping *dollar spot* while giving you broad spectrum disease control.

In addition, BAYLETON eliminates costly multiple applications. You see, it works systemically, entering the plant and working from the inside. Since BAYLETON won't wash off, it lasts longer.

For *leaf spot,* treat with DYRENE® Turf Fungicide. Quite simply, nothing works better. Plus, the flowable formulation of DYRENE gives you longer residual control than regular contact fungicides. And that adds up to a lower cost per day of control.

Best of all, both BAYLETON and DYRENE have a long history of unmatched performance.

For more information, contact your Mobay distributor or Mobay sales representative. They can set you up with a fungicide program that'll help you keep your acres looking like a little heaven on earth.

Bayleton
Dyrene

Treat your fairways with BAYLETON and DYRENE. It keeps your customers from tracking disease up onto your tees and greens, and raises the overall quality of your course.

Apply BAYLETON for broad spectrum control on a wide variety of ornamental plants.

Plant turf varieties that resist diseases in your area. Apply a balanced fertilizer. Aerate, irrigate, and dethatch periodically.

BAYLETON and DYRENE are Reg TMs of Bayer AG, Germany ©1989 Mobay Corporation

In addition to dollar spot, BAYLETON prevents summer patch, anthracnose, and other major turf diseases.

DYRENE prevents brown patch and leaf spot with excellent residual control.

Mobay Corporation
A Bayer USA Inc. Company

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120
816-242-2333

Circle No. 121 on Reader Inquiry Card

GREEN INDUSTRY NEWS

AUGUST 1990, VOLUME 29, NUMBER 8

LANDSCAPE MANAGEMENT

LEGISLATION

Water woes on the horizon for golf supers in Georgia

ATHENS, Ga. — The University of Georgia Cooperative Extension Service reports that golf courses in the Peach State will soon need agricultural water use permits.

Golf courses and other recreational turf are included in the provisions of a law requiring a permit for all groundwater and surface water withdrawals of 3 million gallons per month for "agricultural" uses.

"If they're watering fairways, even nine-hole golf courses would probably use that much water," says Tony Tyson, irrigation specialist with the extension service. "If they water just the greens and tees," continues Tyson, "they probably don't use enough water to require a permit, although some 18-hole courses might need a permit even then."

According to Dan Rahn, news editor for the extension service, applications are automatically approved for any golf course or other recreational turf with a withdrawal system that was in place before July 1, 1988, provided the applications are sent in by July 1, 1991.

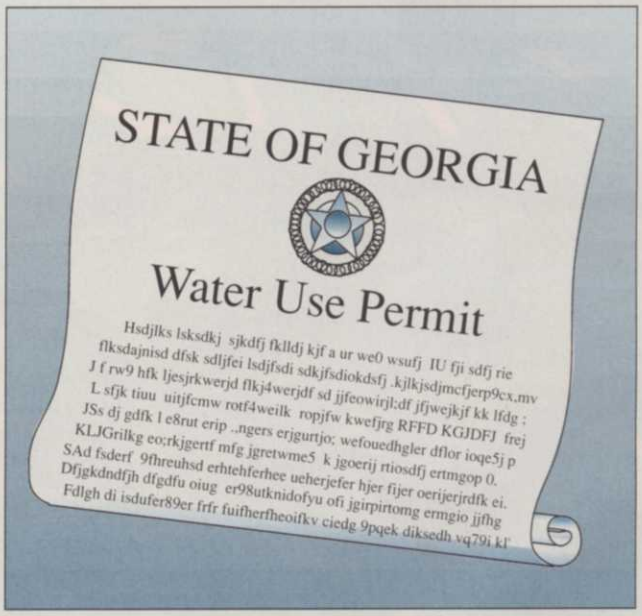
The dry weather situation is becoming serious in many southern states. Florida, for example, is in the second year of drought conditions, following 30 years of less than average rainfall. That merited a recent cover story in *The Wall Street Journal*, which quoted sources as saying the wetland drainage there has caused a "climate shift," making the state permanently drier.

"We in the metropolitan Atlanta area are feeling acute water shortages," says Rahn, "so there's a need—or feeling of a need—to get a handle on what our water resources are." Rahn says that the conservationist mood has extended through other parts of the state. "People pretty much see the need to (conserve)," admits Rahn, though he thinks the seriousness of the situation is a scary thought.

"This is the means to monitor and manage the water resource," says Rahn, "and we've got to make golf course and athletic turf people realize that they're included in this too."

There are exceptions to the law where recreational turf areas need "industrial" water use permits.

In other locations, however, if a golf course pumps an average of 100,000 gallons of water per day in any month from any single source—such as a well, pond, or creek—it must have an "agricultural" water use permit. According to Tyson, that equates to the amount of water needed to put two inches of water per week on 14 acres.


STATE OF GEORGIA
Water Use Permit
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The Environmental Protection Division warns that there will be strict adherance to the July 1, 1991 deadline.

"It's to their advantage to get permits now," says David Ashley, manager of the EPD Water Resources Program. "During this first phase we'll issue a permit for the full capacity of the system. But there's a chance the permit will be reduced after that. In some areas you may not get a permit for the maximum capacity of the system."

The EPD urges golf course personnel to apply for permits immediately, as it can process just 15 applications per day.

—*Terry McIver*□

LAWN CARE

ChemLawn is pleased with settlement

SYRACUSE, N.Y. — ChemLawn Services Corp. has settled a lawsuit in New York State Court over the wording of advertising in brochures published between 1985 and 1987.

ChemLawn challenged charges by the state attorney general Robert Abrams that the brochures contained inaccurate or misleading information. ChemLawn describes that information as "technical information that ChemLawn provided customers in response to their health,

safety and environmental questions."

Neither side is required by the settlement to concede or admit wrongdoing.

"We are pleased with the agreement we have reached," says Stephen A. Hardymon, ChemLawn's vice president of environmental affairs and media relations. "It incorporates current ChemLawn communications practices, in that when we discuss technical issues in any informational piece, we define technical terms in language that our customers can understand."

Hardymon says ChemLawn "is responsibly addressing consumer issues, and the information we currently give our customers demonstrates that."

In a show of cooperation, ChemLawn recently supplied the Environmental Protection Agency and the Federal Trade Commission with its written advertising guidelines. The company plans to introduce those guidelines to the Professional Lawn Care Association of America (PLCAA) at the association's board of directors meeting in August.

Tom Delaney, PLCAA director of government affairs, was to meet with the FTC and EPA officials on July 26, to lay groundwork for establishing advertising standards.

Hardymon: addressing consumer-related issues

"Right now, the EPA doesn't have any regulations in regard to applicators," says Delaney. "The only people that can deal with (applicators) right now are with the Federal Trade Commission, and they don't know anything about pesticides."

Delaney is concerned over an apparent a double standard being followed by government agencies.

According to Delaney, the FTC and EPA use the words "safe" and "low-toxicity," in their own brochures on lawn care.

Ironically, it was that kind of wording that started Abrams's campaign against ChemLawn advertising. □

SEED

European market plays hard to get

Hurley: Selling European markets can be difficult.

MARTINSVILLE, N.J. — Many American products gain easy entry into European markets. Not so for grass seed.

According to Dr. Richard Hurley of Lofts Seed Co., lack of distinction eliminates many American varieties from the European market.

"This goes back to the earliest days of seed research and development," remembers Hurley, "when most of the tall fescues were developed at Rutgers University. Most of the

continued on page 12

SHORT CUTS

TEXAS TURF...Dr. Milt Engelke, of Texas A&M University has high hopes for current research programs which center on zoysia and bentgrass. "Objectives are to reduce the maintenance and water requirements," says Engelke. "We're working in an environmental niche that reflects all stresses—hot, wet, dry, and cold. At some point, we want to be able to impose those stresses on plant species." If Engelke is correct, the research industry is light years ahead of the rest of us.

"We have the germplasm to give you a grass you'll never have to mow or fertilize, and that will look pretty good all the time," reveals Engelke. "But it will probably cost me $1000 or $1500 per acre to produce. And there's not a market out there for that. We have to look at delivering that to the consumer. It's one of the things we feel ties (research) in with commercial industries."

NEW POST...Dr. Charles Darrah was recently appointed president of Ag-Vantage, Inc., a Columbus, Ohio agricultural consulting firm. He also is chief operating officer of CLC Labs, the firm's independent soil testing laboratory. Darrah served as director of technical services at ChemLawn for the past eight years. His expertise in specialty fertilizer development is known throughout the green industry.

ALL-STAR ADVISOR...LM editorial advisor **Dr. Kent Kurtz,** of Cal Poly Pomona, was at Chicago's Wrigley Field recently to observe the field prep prior to the All-Star game. Kurtz says the field had what looked to be a little pythium. The solution was "a good shot of iron, and we mowed off the problem." Kurtz says Wrigley field looks better than it has for many years, thanks to the efforts of **Lubie Veal, Roger O'Connor** and **Frank Caparilli.**

NEW ADDRESS... The nation's oldest and largest organization of landscape contractors and their suppliers, the California Landscape Contractors Association, has relocated its headquarters to 2021 N. St., in Sacramento. Their phone number remains the same.

TAKING RESUMES... The Western Agricultural Chemicals Association (WACA) is looking for a new executive director. Anyone interested should contact **Pat Kline** in the WACA office at (916) 446-9222.

SEED *from page 11*
germplasm can be traced back to the original Rebel program. A lot of the varieties on the market in the U.S. are very close in appearance. When they put them to the test over there, they quickly find this out. Any that are similar receive a distinction test. Any that show it's not distinct gets rejected. There are a lot of look-alikes in the U.S."

Loft brands currently being used in Europe include Palmer and Repel perennial ryegrasses and Rebel II tall fescue.

Hurley says a natural follow-up to European seed marketing has been a tremendous increase in interest from golf professionals. "It's a whole new ballgame when it comes to selecting grasses. The local people there quickly decide which species will and will not work. Licensing is important. Different countries have their own lists. Unless an American company is tied in with a big European company, they're not going to do much business over there."

On the production side of the seed coin, company chairman Jon Loft speaks of the importance of Lofts New Zealand and Australia operations.

"It's getting to be where 25 percent of our proprietary grasses are grown in places other than the U.S., because our business is growing," admits Loft. "We are now growing seed in New Zealand and Australia, so we in effect get two productions each year."

Lofts New Zealand and Australia harvests take place in December and January. □

PRODUCTS

O.M. Scotts warns customers of tainted fertilizer/fungicide

MARYSVILLE, Ohio — In an open letter to their customers this summer, O.M. Scott & Sons warns of FF-II fertilizer/fungicide contaminated with atrazine.

"Unfortunately, last fall...a limited amount of contaminated product was released to the market," the letter says. "Our technical representatives were notified as soon as we learned of this issue. They are contacting each customer, individually, who received FF-II from the suspect production."

According to the letter, golf course greens treated with FF-II came through the winter in excellent condition, but some courses began noticing small spots resembling dollar spot.

"Scotts took immediate action to insure that the golf courses were back in playing condition as soon as possible," the letter notes.

Scotts says that "the following actions to insure that this type of contamination never occurs again" are being taken:

- all products containing atrazine will be dyed a bright color for easy identification;
- the quality assurance department will increase checks on production runs; and
- bioassay tests will be conducted as an additional check. □

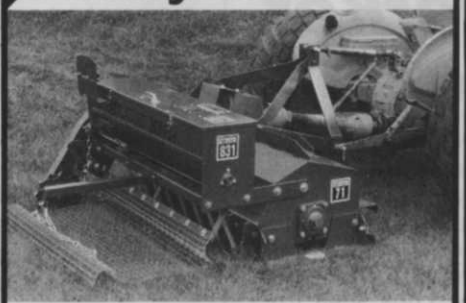
NEXT MONTH:

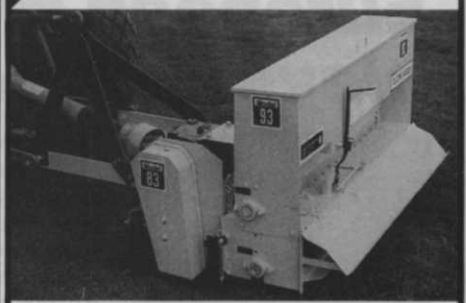
'91 Buyer's Guide

Your complete guide to chemicals, equipment, turfseed and more...

Stop Double Handling!
Olathe
Model 54HL Self-Propelled Turf Sweeper

3-wheeled sweeper cleans 5 ft. swath of grass clippings, leaves, thatch, rocks and other debris, then hydraulically dumps at 5½ ft. 3 cu. yd. hopper.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

Reduce Watering!
Olathe
Model 71/831 Aerator/ Polymer Planter

Plant water-absorbing polymer to reduce amount and frequency of watering. 48" swath with blades on 6" centers.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

Big 4' Swath!
Olathe
Model 83/93 Slit Seeder/ Thatcher

For heavy-duty jobs. Slit seeds 48" swath on 3" centers. Variable seed feed control.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

Circle No. 126 on Reader Inquiry Card

Spray herbicide directly over the top of your established shrubs and ornamentals? Go ahead. Surflan® lets you spray with complete confidence.

All you'll see are the bright colors of your landscape or lawn. No crabgrass. No oxalis. No chickweed. And no prostrate knotweed and 50 other grasses and weeds, either. You won't see them for six to eight months, in fact, when you spray Surflan preemergence herbicide.

You'll also see Surflan is more stable on soil surfaces. It'll wait three weeks for water. Then it stays put, even in heavy rainfall, to provide outstanding weed control. Yet it's gentle enough to spray over the top of 175 different ornamentals.

So go ahead. Fill up with Surflan and take your weed control where you never thought possible. Over the top of your ornamentals without injury. See your Elanco distributor. Or call toll-free: **1-800-352-6776.**

Elanco Products Company
A Division of Eli Lilly and Company
Lilly Corporate Center
Dept. E-455, Indianapolis, IN 46285, U.S.A.
Surflan® — (oryzalin, Elanco)

Circle No. 106 on Reader Inquiry Card

Take your weed control where you never thought possible.

GREAT ON THE GREAT OUTDOORS.

GREENSKEEPER 20-4-10

HOMOGENEOUS FERTILIZER

The great outdoors has a wide range of turf conditions. So where do you turn for one superior, yet economical feeding? Greenskeeper 20-4-10. This homogeneous fertilizer contains 40% organic nitrogen and is formulated for immediate turf green-up and sustained feeding. Yet it is cost-efficient for use on a diversity of turf areas. From your source for premium quality turf products.

Lebanon
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Circle No. 115 on Reader Inquiry Card

RESEARCH

Good news: pesticides leach less than originally believed according to Cornell findings

ITHACA, N.Y. — Findings to further indicate that pesticide leaching is not as pronounced as often believed are to be released by Cornell University researchers in October.

Dr. Marty Petrovic of the Cornell University horticulture department has completed research into the leaching properties of 2,4-D, dicamba, Sevin, and Daconil. Three media were used in the trials: sand, sandy loam and silt loam.

According to Petrovic, the research findings are improvements over standard, conservative leaching models used by government agencies to indicate leaching potential.

What's interesting to Petrovic is that the models "should have predicted a lot more leaching than we actually found; there's something 'unique' in the turf system that's reducing the amount of pesticide moving down.

"If people do use these models (as guides), and (independent tests) are not showing any leaching, that's probably true. If they show some leaching, then we may have to question whether more research is needed."

Petrovic conducted his research in the fall of 1989, and again this summer. The different seasons provided contrasting climatic conditions.

Earthworm activity also seems to play a part in product movement. Petrovic indicates the tests done in silt loam showed that substantial amounts of pesticides followed earthworm channels. These passageways allow water and pesticides to move deeper and faster.

Petrovic will present his complete findings at an arborist's association meeting in San Antonio, Oct. 21-26. □

LETTERS

Don't knock Earth Day

To the editor:

I read the June issue and was happy to see articles about finding ways to use less pesticides and control the problems of water use. We are trying to do the same thing here at the arboretum.

Then I read your editorial ("Earth Day at 'the zoo'"). Unfortunately, Mr. McIver has written a piece that I can only describe as nonsensical, self-serving, and unprofessional. The description of the people selected for the article sounded like his self-image was being threatened by a few of the more extreme elements of the environmental movement, and he apparently thinks the whole landscape industry feels the same way.

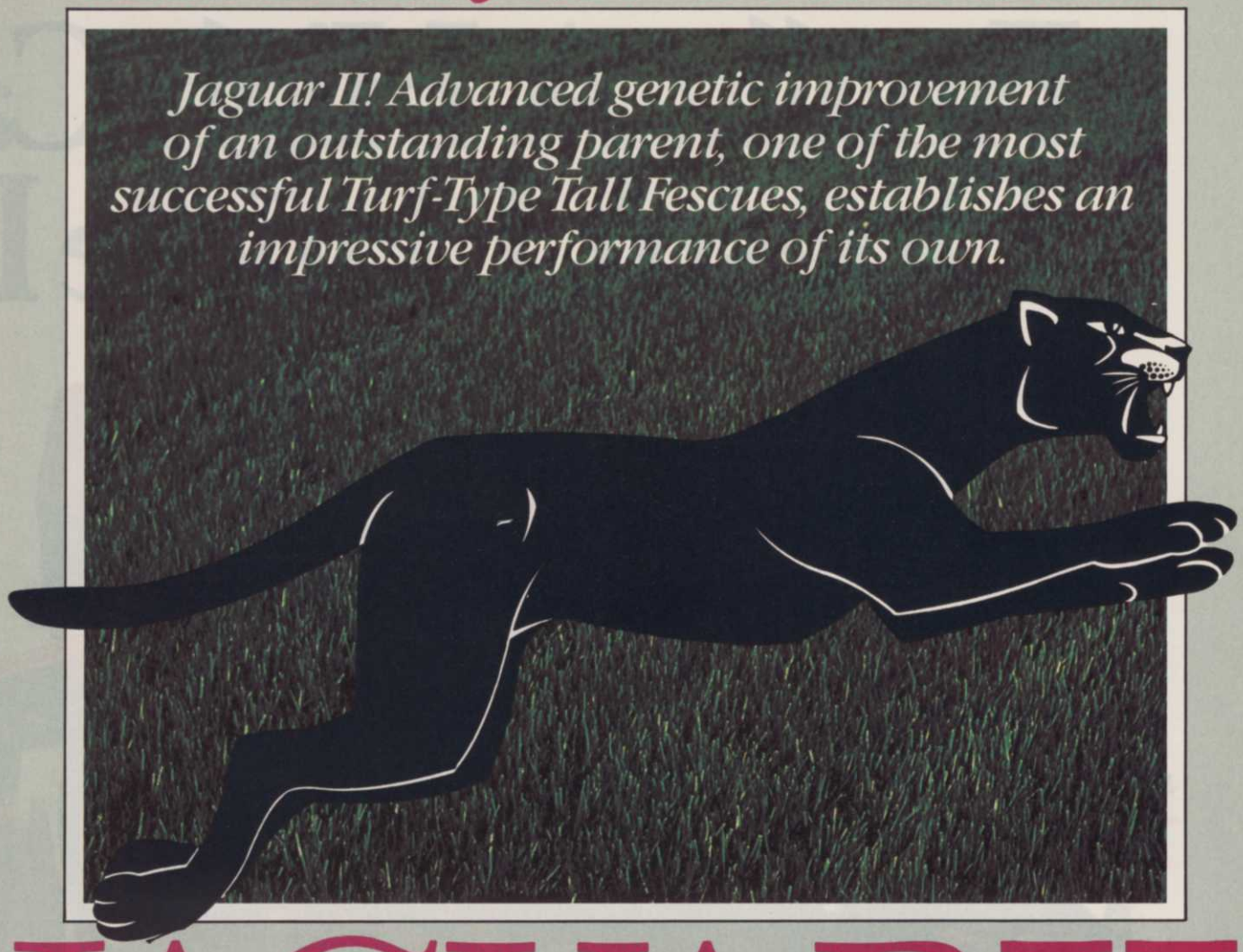
Mr. McIver is living and thinking in the past. His insecurity about changes that are happening in this world shows through. You should be encouraging the industry to forge ahead with environmental responsibility, not bashing Earth Day.

Here at Mercer, we cooperated with Texaco and others during our Earth Day celebration in order to exchange ideas and bring about change in a meaningful manner. Doing business in the oil and chemical capital of the U.S., we know how these companies operate. There are signs of significant changes.

The description of Earth Day as a zoo and, indirectly, as a communist plot, could

continued on page 18

The Best Just Gets Better!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Circle No. 135 on Reader Inquiry Card

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Operating the 580-D is incredibly easy. Only Toro provides an adjustable tilt steering wheel and column. All controls are at the operator's fingertips, even cruise control.

Transport is easy too. An exclusive rotating hinge lowers the outboard cutting units behind the operator for a clear view to the side and rear. A balanced design allows you a stable 20 mph transport speed because the weight of the outboard cutting units is rotated to the rear.

Digital readouts display vital engine/machine functions at the touch of a button.

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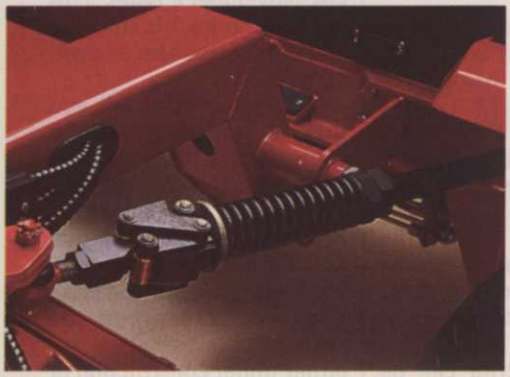
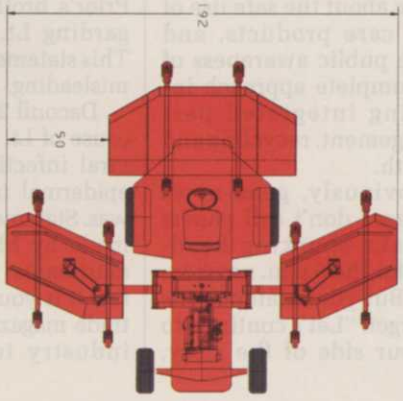
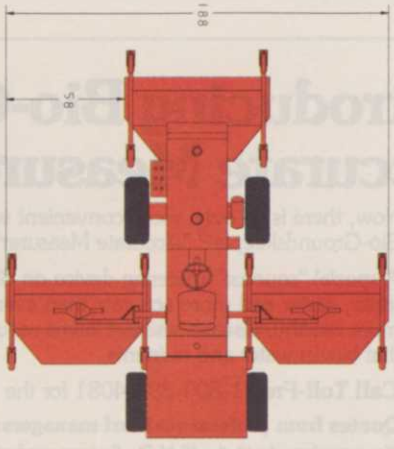
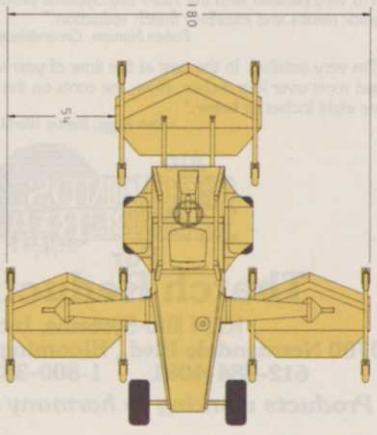


Toro's outboard cutting units also include an exclusive break-away protection feature. Should the operator misjudge distance, the wings will pivot away from the object that has been hit.

Another Toro exclusive allows you to raise one or both of the outboard cutting units inside the traction unit width. The 580-D can then trim between objects less than 8 feet apart with the 92" Triflex® cutting unit.







The 580-D's wide stance and short wheelbase give it maneuverability and stability. A short 76" wheelbase lets you turn an 18" uncut circle without braking. And Toro's exclusive swept-forward wing design keeps the tips of the outboard cutting units in line with the front drive wheels improving operator control and visibility.

For even more versatility, the 580-D includes these accessories: an 8-foot front broom attachment, a roll over protection system, a canopy, a cab and a road light package.

If you've been sacrificing ease of operation for high capacity, it's time you saw the revolutionary machine that gives you both: the new Groundsmaster 580-D from Toro. Call your local Toro distributor to see the Groundsmaster 580-D or contact Toro at the address below. You'll see firsthand how productive and versatile large-scale turf mowing can be.

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The Toro Company, Commercial Marketing Services, 8111 Lyndale Ave. So., Minneapolis, MN 55420.

Circle No. 132 on Reader Inquiry Card

LETTERS *from page 14*

not be farther from reality. I look forward to more intelligent and professional editorials from your magazine in the future.

Stephen M. Young
Mercer Arboretum & Botanic Gardens
Humble, Tex.

(The "more extreme elements" in the editorial were genuine Earth Day representatives, McIver contends—one of whom was the event's master of ceremonies.

We think the public deserves to hear both sides. Perhaps the people in Humble should advise their Cleveland peers.—ED.)

Same article; different view

To the editor:

I read with interest your editorial "Earth Day at 'the zoo'."

Just to confirm your supposition, the Professional Lawn Care Association of Mid-America (PLCAMA) attempted to obtain booth space at the Kansas City Earth Day celebration. Our inquiries were met with an emphatic "We don't want you there!"

I talked by phone with the local director for about 20 minutes. He finally reluctantly agreed to send me booth information even though it was "unlikely our application would be approved." I never received the promised material.

Any attempts on our part to convince environmental extremists are doomed to futility. But we must continue to educate the general public about the safe use of lawn care products, and create public awareness of our complete approach including integrated pest management, recycling and so forth.

Obviously, good-news messages don't sell papers or make shocking headlines for the 6 p.m. news report. But your statement is on target: "Let's continue to tell our side of the story, whenever and wherever we can...or are allowed."

Thanks for your editorial. You provided a refreshing viewpoint on Earth Day festivities we would never have heard from most media sources.

Olivia Golden
Executive Director
Kansas City, Mo.

Daconil framed in hearings

To the editor:

After reading the news article in the May 1990 issue, I was stunned to read the quote made by Lt. George Prior's brother Thomas regarding Lt. Prior's death. This statement was false and misleading.

Daconil 2787 was not the cause of Lt. Prior's death. A viral infection called toxic epidermal necrolysis (TEN) was. Statements like this one made by Mr. Prior can be detrimental to our industry. I feel it is your obligation as a trade magazine of the green industry to publish this statement and correct the wrongful accusation toward Daconil 2787.

Jeff Lansdowne
Pocono Farms C.C.
Tobyhanna, Pa.

Golf courses recover nicely

To the editor:

I sincerely appreciate Will Perry's accuracy in quoting my comments about Hurrican Hugo damage in last November's issue. This indicates to me his sincerity and professionalism as managing editor.

I am pleased to tell you that the golf courses in the Grand Stand (S.C.) area are recovering nicely and that our rate of play is picking up. It is my understanding that our new course development is proceeding at a brisk pace—something on the order of 10 to 15 courses are either under construction or were started this spring.

Dr. Paul Alexander
Horry-Georgetown Tech
Conway, S.C.

Introducing Bio-Groundskeeper® "Accurate Measurer" starter size kit!

Convenient 32-oz. Starter Size Kit covers 25,000 square feet

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Robert Hansen, Groundskeeper, New York Jets

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Rich Riggs, Sentry World, Stevens Point, WI

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*Rhode Island University test. Details available upon request.

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We offer more than 10 exclusive varieties of grass seed. But only one color.

At Scott we may offer a lot of exclusive seed varieties. But we have only one set of standards. The highest.

And those high standards begin with our breeding and varietal development. We not only work closely with universities and other seed developers, we have our own extensive in-house breeding program, with our own testing facilities all over the country.

The result? Seed to meet any requirement. Exclusive varieties like our Coventry, Abbey, Bristol and Victa Kentucky bluegrasses; Accolade, Caravelle, Loretta, Applause and Ovation perennial ryegrasses; Banner Chewings fescue; and Chesapeake and Aquara tall fescues.

But seed development is only part of the story. We have the most stringent requirements and controls for clean seed in the industry. From grower selection all the way through cleaning, testing and packaging, our standards are uncompromising. In fact, we pioneered the seed business over 100 years ago.

And only our seed comes equipped with a Scott Tech Rep. They're true agronomists, who can make recommendations and develop complete seeding and fertility programs to fit your specific needs and problems.

Of course, we still aren't content. We're constantly working harder to develop even better seed varieties.

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EVENTS

AUGUST

12-16: International Society of Arboriculture Annual Conference, Sheraton Centre Exhibit Hall, Toronto, Ontario. Contact: ISA, 303 West University, Urbana, IL 61801; (217) 328-2032.

12-16: Conserv '90 on water conservation, Phoenix (Ariz.) Civic Plaza. Contact: Conserv '90, 6375 Riverside Dr., Dublin, OH 43017; (614) 761-1711.

12-17: Perennial Plant Symposium, Hyatt Ravinia Hotel, Atlanta, Ga. Contact: Dr. Steven M. Still, Perennial Plant Association, 3383 Schirtzinger Rd. Hilliard, OH 43026; (614) 771-8431.

14: Associated Green Industries of Northeastern Ohio Summer Field Day, Roemer Nurseries, North Madison, Ohio. Contact: Associated Green Industries, (216) 572-2784.

15-16: Texas A&M Field Day. Contact: Bill Knoop or Milt Engelke, (214) 231-5362 or (214) 343-5011.

15-16: Western Agricultural Chemicals Association: "Involuntary Exposure, Cause for Concern?", Hyatt Regency Hotel, Sacramento, Calif. Contact: Jennifer Ryder-Fox, technical coordinator, (916) 446-9222.

21: Golf Course Construction/Renovation and Golf Day, State University of New York, Delhi, N.Y. Contact: New York State Turfgrass Association, (800) 873-8873; (518) 783-1229.

23-25: Landscape Design Short Course for Residential Properties. Contact: Conference Office, Box 8112, Georgia Southern College, Statesboro, GA 30460; (912) 681-5189.

24-28: International Garden Centre Congress, New York City. Contact: IGCC, c/o Garden Centers of America, 1250 I St. NW, Suite 500, Washington, DC 20005; (202) 789-1893.

SEPTEMBER

4-6: Midwest Agricultural Chemicals Assoc. Annual Meeting, Pheasant Run, St. Charles, Ill. Contact: MACA, P.O. Box 2125, Northside Station, Sioux City, IA 51104-0125; (712) 277-7380.

4-7: International Plant Propagators' Society Annual Meeting, western region, Marriott Mission Valley Hotel, San Diego, Calif. Contact: (619) 692-3800.

5-7: "Beginning in the Nursery Business." Contact: Virginia Tech Continuing Education Program, (703) 231-5156.

7-9: "Managing Urban and Suburban Trees Through Ordinances," Radisson Airport Hotel, Columbus, Ohio. Contact: American Society of Consulting Arborists, 700 Canterbury Rd., Clearwater, FL 34624; (813) 446-3356.

10-11: Golf Course Development and Investment, Oak Brook Hill Hotel and Resort, Oak Brook Hills, Ill. Contact: Institute for International Research, 437 Madison Ave., 23rd Floor, New York, NY 10022-7001; (212) 826-1260.

12: "Developing and Implementing an In-House Maintenance Program." Contact: *In-site* newsletter, 24380 N. Highway 45, Vernon Hills, IL 60061-9907.(312) 634-8888.

12-14: New England Park Association Fall Conference and Workshop, Lighthouse Inn, Cape Cod, Mass. Contact: Jeff Maron, NEPA, Wickham Park, 1329 West Middle Turnpike, Manchester, CT 06040; (203) 528-0856.

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Circle No. 122 on Reader Inquiry Card

For best results, thoroughly irrigate prior to treatment. Follow your application by watering in to a depth of 1 to 1½ inches.

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When you have grub control this effective, you have grounds to celebrate.

DYLOX controls armyworms, bagworms, and stink bugs on your trees, shrubs, and flowers as well as controlling cutworms and sod webworms on your turf.

OFTANOL also controls billbugs, cutworms, chinch bugs, Hyperodes weevil, and sod webworms.

To identify grub populations, look for patches of wilted, dead or dying turf. Grub-infested turf has pruned roots which make it easy to pull back like carpet.

Some of the most celebrated courses in the country turn to Mobay products for *grub protection*.

For preventative treatment, there's OFTANOL® Insecticide. It controls *grubs* longer than any other product available. Apply it in the spring before *grubs* show up. After all, spring rains and temperatures can mask a *grub* problem.

Or apply a pre-damage application of OFTANOL when *grub eggs* hatch and activity begins (usually right after a drought-breaking rain in the early fall). But only apply OFTANOL once a year. If you've already used it in the spring, treat with DYLOX® Insecticide.

Of course, if grub damage turns up, apply DYLOX followed by heavy watering. DYLOX controls *grubs* in as little as 24 to 48 hours.

For more information, contact your Mobay distributor or Mobay sales representative. They can help you make your turf look great. And that makes you look great. Which is cause enough to celebrate.

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Circle No. 120 on Reader Inquiry Card

COVER STORY

TOWARD 2000

LIQUID VS. DRY: THE PENDULUM SWINGS

As customers demand more dry fertilizers because of what they see in the news, the lawn care industry responds.

by Terry McIver, associate editor

Is the lawn care industry doomed to be forever pestered by image problems?

Like a toy poodle nipping at its heels, outcry against chemical product safety or efficacy are relentless.

Even within the industry itself, there are biases toward certain products—inclinations that have shaped how companies do business.

In this case, the subject is liquid and dry fertilizers: what do you use, and why?

When ChemLawn first treated lawns in the late 1960s, it was the trailblazer in liquid lawn care. High-tech, high-volume was the way to go. By the late 1970s and early 80s, there was a preponderance of liquid lawn care companies.

The image problem began about 1983. Activist and media attention and phrases such as "spray drift" and "runoff" and "seeping into the groundwater" aroused public demand for more granular fertilizer applications, which many companies were already using.

So we touch ground in the 1990s, although we're not always landing feet first. And beyond the hype and misinformation, there are valid reasons to choose one or the other formulation.

Agronomic equality

Dr. Chuck Darrah, president of AgVantage, a Columbus, Ohio agricultural consulting firm, says that

agronomically, liquid and dry fertilizers can be used to perform equally.

He reminds turf professionals that, "most nitrogen sources that are used in dry fertilizers are available in liquid form, for example, urea."

Urea is the most commonly-used form of nitrogen in both liquid and dry lawn fertilizers. Darrah says research has shown little or no difference in turf growth and color response to the two forms of N application.

"Likewise," adds Darrah, "the controlled release methylene urea fertilizers as well as the slow release ureaformaldehyde fertilizers and IBDU can be used in liquid sprays or dry fertilizers. Their performance is the same with either application method. The most common exception to this rule is sulfur-coated urea, because it is a product which should only be applied dry. And with a few exceptions the same case can be made for all pesticides. They are available as liquid or dry products and either form can be used to achieve the same results."

View from the field

Lawn care professionals interviewed by *Landscape Management* all prefer granular fertilizers over liquid formulations. Their reasons range from the technical to the psychological.

"You don't have as much surge growth—or quick growth—with granular products as you have with liquid applications," says Bob Priest of Personal Touch Lawn Care, Denver.

Tim Combs, of Combs Landscaping in Westlake, Ohio, says his company has used granular products since it entered the lawn care business 20 years ago. Combs prefers granular products because they are less volatile than liquids.

"With the granular," says Combs, "you get it down into the soil with a little better effectiveness.

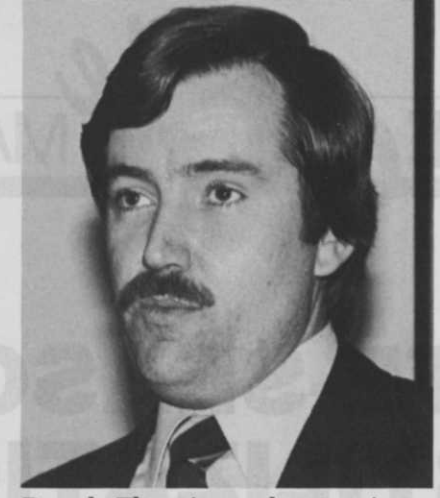
"Another nice thing about a granular product," explains Combs, is that you can target it. Of the four applications we use, only one has a pesticide in it which would be the pre-emergent, pendimethlin. The remainder are straight fertilizer."

Adds Priest: "People prefer granular for a lot of reasons. Granular is more old-fashioned, and I personally feel granular applications are safer."

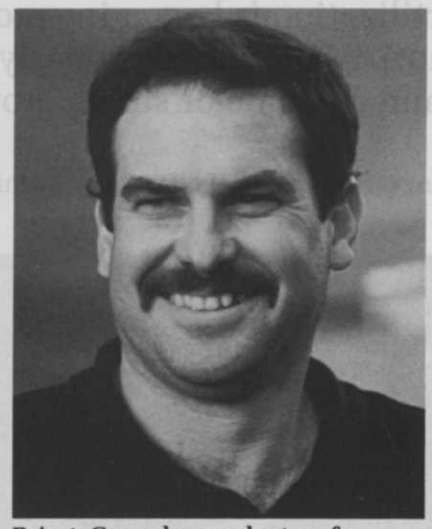
Harper prefers granular products in the fall, since customers are less likely to mow it out.

Freedom of flexibility

Darrah stresses the flexibility liquid



Darrah: There is an advantage in being able to use both formulations.



Priest: Granular products safer.

products lend to the lawn care arsenal, and says surge growth is a myth.

"With liquids," says Darrah, "changing N-P-K grades, using a pesticide at different rates or using multiple pesticides can be easily accomplished. With dry materials, specific products need to be planned, purchased, stored and carried to the site to provide as much flexibility."

There are also those special times when a suitable dry material may not be available. At those times, it's liquids to the rescue.

An example Darrah cites is the situation that requires an application of fertilizer, a pre- and post-emergence weed control product, and insecticide simultaneously.

"This can be easily accomplished with liquids," says Darrah, but it means multiple trips over the lawn to accomplish with drys.

Initial investment spector

The cost required to outfit trucks and provide for storage is a basic—if unglamorous—reason companies may choose dry fertilizer products.

Mike Turner of Custom Lawns, North Olmsted, Ohio, says that the need to get a business off the ground is a great motivator.

"When we first went into business," recalls Turner, "it was easier to start up with a dry method of application, in terms of equipment. You don't have that tank truck investment."

That concern is echoed by Bob Mann of Hunt & Hulteen, Brockton, Mass., who says the time to apply liquid and dry products is "pretty much a wash."

"And with the significant investment in a liquid system comes the containment system and regulations," adds Mann. He says the state of Massachusetts has a set of regulations pending which would place restrictions on containment systems.

The "all dry" full-service lawn care programs really don't exist, in Darrah's opinion, because common broadleaf weeds cannot be effectively controlled with dry post-emergence weed control products.

Turner believes there is a growing market for granular products, and cites the recent move by some larger, predominantly liquid chemical lawn care companies to granular products.

Degree of efficacy does not influence Turner's decision to go granular.

"We do about 2400 lawns," he says, "and the net result is usually the same. I wouldn't be upset if my only choice was liquid or if my only choice was granular."

Turner lucks out every so often when he encounters prospects who say flat out, "I don't want the liquid." Those people, says Turner, are already sold on the dry product, and the point is moot.

Appearances are everything

It's also not just *what* you spray, but how you spray it, as one applicator told of a study that showed brown-colored spray hoses are less likely to incite homeowner concern than yellow hoses.

Are some people simply *afraid* of liquid products? "They want to believe that what a dry company is applying is different than what a liquid company is applying," says Turner, and he offers this example:

After a recent news report on a court decision concerning ChemLawn (see "Green Industry News," this issue), a customer told Turner she was glad to have him as her lawn man. "I wouldn't want what they put on the lawn," the customer said.

Turner's reply: "We put the same thing down that ChemLawn does. And it's the same product that you're going to be buying at your garden center." **LM**

LATE-SEASON FERTILIZATION

Late-season fertilization is becoming more and more popular. And why not? When timed properly, it promotes root, shoot and rhizome or stolon growth.

by Norman N. Hummel Jr., Ph.D., Cornell University

This is the time of the year when thoughts turn to football, pumpkins and apple cider. But for the landscape manager, fertilizing turf areas should be at the top of your "Dumb Things I Gotta Do" list.

Fertilizing turf in the late season is not so dumb. In fact, it is a very sound and widely accepted practice that promotes the health and vigor of your turf.

Why fall? Cool-season grasses are often weakened from the onslaught of summer stresses. Fertilizing in the early fall (mid-August to mid-September in the North) helps the turf recover by promoting root, shoot and rhizome or stolon growth. Cool-season grasses grown in the transition zone can be fertilized later into the fall.

Fertilizing turf in the late season takes advantage of physiological changes in the plant. Turfgrass shoots stop growing when temperatures are consistently below 45 to 50°F. The leaves are still green and photosynthetic; that is, they are still producing sugars. Since the leaves have little use for this self-made food (they are not growing), they transport the sugars to other plant parts.

Benefits of fertilizing in the late season include enhanced root growth and early spring green-up, but without the flush of growth that would have occurred from an early spring application.

Late-season fertilization has gained acceptance by the green industry recently, primarily because it takes advantage of physiological changes in the plant.

Fertilization of cool-season grasses in fall fosters early spring green-up (above). On warm-season grasses, the same practice is much more controversial.

Proper timing

The timing of application is important. Fertilize turf areas after the shoots have stopped growing, but well before the ground freezes. Fertilizing too early may force succulent growth and increase tissue hydration—prime conditions for winter injury. Fertilizing too late may not benefit the plant, and may actually result in fertilizer loss from run-off and leaching. (Don't confuse late season fertilization with dormant fertilization.)

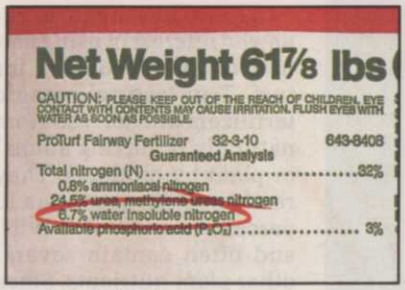
Also, select nitrogen sources that are not temperature-dependent (see table), so that the maximum benefit from the application can be obtained.

Late season fertilization of warm-season grasses is more controversial. The benefits of a late summer fertilization include extended length of greening into the fall, as well as early spring green-up. The early growth, however, may be more susceptible to frost dieback and desiccation. Late season applications of nitrogen may also make the turf more susceptible to direct low temperature injury.

The risk in making late season applications of nitrogen to warm-season grasses is greater on closer-cut turf, and in the northern regions of adaptation for the grass species involved.

continued on page 30

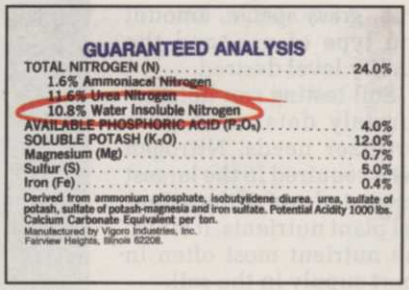
READ ...the fine print.


Net Weight 61⅞ lbs
CAUTION: PLEASE KEEP OUT OF THE REACH OF CHILDREN. EYE CONTACT WITH CONTENTS MAY CAUSE IRRITATION. FLUSH EYES WITH WATER AS SOON AS POSSIBLE.
ProTurf Fairway Fertilizer 32-3-10 643-8408
Guaranteed Analysis
Total nitrogen (N) 32%
0.8% ammoniacal nitrogen
24.5% urea, methylene ureas nitrogen
6.7% water insoluble nitrogen
Available phosphoric acid (P2O5) 3%

Scott's ProTurf

GUARANTEED ANALYSIS
Total Nitrogen (N) 15%
5.5% Water Insoluble Nitrogen
9.5% Uncoated Nitrogen
3.5% Urea Nitrogen
Available Phosphoric Acid (P2O5) 5%
Soluble Potash (K2O) 9%
Magnesium (Mg) 1.0%
Sulfur (S) 8.0%
Iron (Fe) 1.0%
Manganese (Mn) 0.5%
Nutrient Sources: Urea, Methylene Ureas, Ammonium Phosphate, Ammonium Sulfate, Ammoniated Superphosphate, Sulfate of Potash, Oxides, Ferrous Sulfate, Sulfates.
Potential Acidity Equivalent 1300 lbs. Calcium Carbonate per Ton.

Lebanon Country Club


GUARANTEED ANALYSIS
TOTAL NITROGEN (N) 24.0%
1.6% Ammoniacal Nitrogen
11.6% Urea Nitrogen
10.8% Water Insoluble Nitrogen
AVAILABLE PHOSPHORIC ACID (P2O5) 4.0%
SOLUBLE POTASH (K2O) 12.0%
Magnesium (Mg) 0.7%
Sulfur (S) 5.0%
Iron (Fe) 0.4%
Derived from ammonium phosphate, isobutylidene diurea, urea, sulfate of potash, sulfate of potash-magnesia and iron sulfate. Potential Acidity 1000 lbs. Calcium Carbonate Equivalent per ton.
Manufactured by Vigoro Industries, Inc.
Fairview Heights, Illinois 62208.

Par Ex

Down in the analysis area on every fertilizer bag, you'll find the "fine print" that tells you what the big print doesn't. Read all of it. Carefully. But most importantly, look at the percentage of Water Insoluble Nitrogen.

Water Insoluble Nitrogen (WIN)... the key to superior turf.

The higher the WIN percentage, the longer your turf will remain green. And the less often you will have to fertilize. That's because WIN is the percentage of total Nitrogen that is truly slow release. Freeing small amounts of Nitrogen each time it's touched by water (Par Ex® with IBDU®) or activated by temperature or bacterial action (competitive products).

No competitor can deliver as much usable WIN as Par Ex.

Only Par Ex contains IBDU—a unique Water Insoluble Nitrogen source that is 100% available to your turf in a single growing season. Consider that urea formaldehyde products (bacteria and temperature released) contain about one third of their WIN in the form of plastic polymers. Its long-term Nitrogen release is so slow, it's almost useless, and will most likely occur during the hottest periods, just when you don't want it.

For Sulfur Coated Urea (SCU), research has shown that by the time it is spread, about 50% is immediately soluble, effectively doubling your cost of controlled-release Nitrogen and cutting the benefit in half!

Be sure to read your bag.

If the percentage of Water Insoluble Nitrogen isn't listed, there isn't any slow-release Nitrogen. If it *is* listed, chances are it won't be as high as the WIN percentage in Par Ex. Even if it is, we guarantee you that 100% of what we list as WIN is available to your turf every growing season. That means for every six months of growing, you'll receive an additional 46-53% more usable WIN than our competitors can deliver.

So start building your WIN percentage today. Talk to your local Par Ex Representative or call 813/294-2567. And get all the WIN you've been reading about.

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Circle No. 129 on Reader Inquiry Card

If you fertilize warm season grasses in the late summer, use a fertilizer that contains about 1½ as much potassium as nitrogen (like 20-5-30). Potassium has shown to improve the winter hardiness of warm-season grasses.

Fertilizer selection

The turfgrass industry is fortunate to have such a wide selection of fertilizer types and formulations available.

The abundance of products and their supporting literature, however, has made fertilizer selection confusing and sometimes misleading. The nutrient requirements of your turf areas will vary with soil type, grass specie, amount and type of use, and the quality level desired.

Soil testing can help accurately determine your fertilizer needs. Nitrogen (N) is required in the largest amount of any of the essential plant nutrients. It is also the nutrient most often in short supply in the soil.

Many sources of nitrogen are used in turfgrass fertilizers, some quickly available, some slowly available.

Quick release sources contain N as ammonium (NH_4) or nitrate (NO_3), forms readily available to the plant. Examples include urea (46-0-0), ammonium sulfate (21-0-0), ammonium nitrate (33-0-0) and ammoniated phosphates. Fertilizing with quick release N sources results in a quick response of short duration. The nitrogen in quick release sources is available regardless of temperature. Thus, they are well suited for late season applications.

Slow-release N sources, sometimes called controlled release or water-insoluble fertilizers, include natural organics, synthetic organics, or coated nitrogen materials. The release of nitrogen from slow release sources may require microbial breakdown alone, or in combination with chemical or physical breakdown. Since the activity of micro-organisms is affected by soil moisture and temperature, the rate of nitrogen release from some materials may vary with season and weather (see table).

Fertilize turf areas after the shoots have stopped growing, but well before cold weather freezes the ground.

Slow-release selections

The amount of slow release nitrogen in a product is listed in the guaranteed analysis on the bag. The slow release portion of N in the product is listed as percent water insoluble nitrogen, and is expressed as a percentage by weight of the bag's contents. Coated fertilizers will have the slow release portion listed as percent controlled release N, or CRN.

When comparing fertilizers, it is useful to know the percentage of the nitrogen in a slow release product. This can easily be determined by dividing the percentage of water insoluble nitrogen (WIN) by the total N and multiplying by 100.

For example, a 24-4-12 turf fertilizer has 24 percent total N, 4 percent available phosphoric acid, and 12 percent soluble potash. If we divide 12 by 24 and multiply by 100, we have determined that half the nitrogen in this product is WIN, or slow release. The other half is quickly available N. A turfgrass fertilizer should contain at least 35 percent of the nitrogen as WIN to have any slow-release characteristics.

There has been a renewed interest in using natural organic fertilizers for turf. True natural organic fertilizers are derived from naturally occurring animal or plant by-products. They rarely contain more than 10 percent N, most of it WIN, and often contain several other plant nutrients. Since the release of nitrogen from natural organics depends on microbial activity, they may not be the best choice for a late season application.

Milorganite is an activated sewage sludge that has long been the standard natural organic product used in the turfgrass industry.

Recently, the selection of natural organic fertilizers has increased to include several other products composed of dried blood, bone meal and seed meals (Ringer products), and poultry litter (Sustane, Plant Right). Again, the use of these products in a late season program would be equivalent to a dormant fertilization. The

Environmental aspects of late season fertilization

The agronomic benefits of late season fertilization are so well documented that it has become accepted practice in the turfgrass industry. But are there any potential adverse effects to late season fertilization?

Late fall, winter, and early spring are times of the year when many aquifers are recharged by the ample precipitation these seasons bring. It is a time when the potential to leach soluble substances, such as nitrate, is at its greatest.

Researchers at Cornell University have studied nitrate leaching from late season applications of nitrogen on the sandy loam soils of Long Island. They have reported that as much as 40 percent of the applied nitrogen will leach below the rootzone when soluble sources are used. This not only represents a serious environmental threat (all of Long Island's potable water comes from aquifers), but it is an inefficient use of nitrogen as well.

It was also shown from these studies that nitrate leaching can be prevented by using slow release sources. The catch-22 is that the agronomic performance of an N source in a late season application was directly related to its potential to leach. In general, fertilizers that did not leach did not perform well.

The outcome of this work has forced us to take a second look at our recommendations for fertilization on sandy soils. We are no longer recommending late season fertilization to consumers on Long Island (and other areas with highly permeable soils), and cautioning commercial applicators to select only N sources such as IBDU and sulfur-coated ureas for their late season application.

Turfgrass managers in similar situations around the country should consider the same.

—Dr. Hummel□

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For longer-lasting, broad-spectrum weed control, excel with granular XL.

Nitrogen Source	Analysis	Source of N	Manufacturer or Distributor
QUICK RELEASE			
Urea	46-0-0	urea	several
Ammonium nitrate	33-0-0	AN	several
Ammonium sulfate	21-0-0	AS	several
Ammonium phosphate	18-46-0	DAP	several
UF reaction products			
N-Sure	28-0-0	urea/triazone solution	Triazone Corp.
Formalene Plus	30-0-0	urea/sol. methylene ureas	Triazone Corp.
FLUF	18-0-0	urea/ureaform	Cleary
Coron	28-0-0	urea/methylene ureas	Coron Corp.
Nutralene	40-0-0	methylene ureas	Nor-Am
Methylene urea	39-0-0	methylene ureas	O.M. Scott & Sons
Nitroform (Gran.)	38-0-0	ureaform	Nor-Am
Nitroform (Powder)	38-0-0	ureaform	Nor-Am
Natural organics			
Milorganite	6-2-0	activated sludge	Milwaukee Sewarage Comm.
Sustane	5-2-4	composted turkey litter	Sustane Corp.
Ringer products	6-1-3	seed & bone meals, blood	Ringer Corp.
Plant Right	3-4-3	composted poultry litter	Plant Right Corp.
IBDU	31-0-0	IBDU	Par-Ex (Estech Chemical)
Coated materials			
Sulfur-coated urea			
with sealant	varies	urea	Lesco, Purcell, others
w/out sealant	38-0-0	urea	O.M. Scott & Sons
Resin-coated urea	41-0-0	urea	Par-Ex (Estech Chemical)

Key
L = Liquid
G = Granular (Delivery form)
M = Minimal
S = Somewhat
V = Very much
F = Fair
P = Poor
NA = Not available
E = Excellent
G = Good

soil temperatures are too cool for much of the N to be released. Natural organics applied in late season would, however, leave a pool of organic N in the soil that would become available in spring.

Synthetic organics

Synthetic organic fertilizers are a class of chemically combined forms of nitrogen that includes ureaformaldehyde reaction products and isobutylidenediurea (IBDU). Ureaformaldehyde (UF) products vary in their chemical make-up, some being suitable for a late season program, some not.

A UF reaction product is a mixture of polymers (chemical chains) of various lengths. The longer the chain length, the longer it takes for microorganisms to break them down. Thus, the N is tied up, and then released over time.

Products such as Nitroform, and formulations containing Nitroform, have a large percentage of longer-chained polymers. These would provide very little available nitrogen if applied in late fall. They are better when used in warm seasons.

Scott's methylene urea products and Nor-Am's Nutralene contain a large percentage of shorter-chained polymers, and an ample amount of quickly-available N. Nearly all the N in these products will become available within a few weeks under normal growing conditions. Scott's products and Nutralene contain enough available N, however, to produce a noticeable response from a late season application.

Liquid reaction products

Several UF reaction products can be applied in liquid form from sprayers. Fluf is a flowable UF with about 75 percent of the nitrogen in quickly available form. Other products such as Formalene, N-Sure and Coron contain soluble methylol and methylene ureas, as well as free urea. Since most of the N in these products is readily available, they should all work well in a late season program.

IBDU is a synthetic organic N source containing 31 percent N, most of it as WIN. The splitting of IBDU into urea and other by-products requires the presence of water. While the release of N from IBDU is moisture dependent, it is only slightly affected by temperature. IBDU is well suited for a late season program. The best results, however, will be obtained if finer grades are used.

Coated materials

The most widely used coated fertilizer is sulfur-coated urea (SCU). The sulfur used to coat urea (a quick release N source) prevents the urea from coming in contact with water. A sealant on the outside of the sulfur seals any defects in the coating. Urea N becomes available as the sealant and sulfur coating degrade.

Factors that contribute to the release of N from SCU include coating characteristics, moisture, temperature and particle size.

Scott's slow-release encapsulated fertilizer (SREF) is a sulfur-coated urea without a sealant. Since defects in the coating are exposed, urea is very quickly released from the pellet. Products containing SREF would, therefore, be well suited for a late season program.

% of N as WIN	Delivery Form	Approximate length of Response	Factors affecting Release			Salt Index	Free Urea	Suitability for Late Fall
			Temp.	Moist.	pH			
0	L,G	6 wks	M	M	M	75		E
0	L,G	6 wks	M	M	M	105		E
0	L,G	6 wks	M	M	M	69		E
0	G	6 wks	M	M	M	34		G
0	L	6 - 8 wks	M	M	M	NA	28%	G
0	L	6 - 8 wks	M	M	M	NA	40%	G
25%	L	6 - 8 wks	S	S	M	NA	>16%	G
0	L	6 - 8 wks	M	M	M	NA	> 3%	G
36%	G	8 wks	S	S	M	NA		G
36%	G	8 wks	S	S	S	25		G
71%	G	10-12 wks	V	V	S	10		P
66%	L	10-12 wks	V	V	S	10		P
92%	G	10-12 wks	V	V	S	4		P
70%	G	10-12 wks	V	V	S	NA		P - F
83%	G	10-12 wks	V	V	S	NA		P
60%	G	10-12 wks	V	V	S	NA		F
89%	G,L	10-15 wks	M	V	V	5		G - E
-	G	12-14 wks	S	S	M	NA		F - G
-	G	6 - 8 wks	M	M	M	NA		G - E
-	G	10-20 wks	M	S	M	NA		F

The nitrogen sources listed in this table are often used in formulations of many sorts. The type of formulation will influence many of the characteristics listed. Every attempt has been made to provide accurate information. Exclusion of products was not intentional.

Source: Dr. Hummel

Sulfur-coated ureas produced by Lesco and Purcell have a sealant on the coating and will provide a uniform, prolonged release of N during the growing season. The rate that the coating degrades, however, depends on soil temperature.

If you plan on using SCU as a late season fertilizer, better response will be obtained from the faster-releasing, fine or microprilled grades of SCU.

Other elements

Other elements often thought to be important in a late season fertilizer program are phosphorus, potassium and iron. But are they important?

Confusion and controversy endure over the benefits of P and K in a late season fertilizer.

Right or wrong, some practices have weathered both the years, and the advances made in our understanding of late season fertilization. For example:

Use of a high phosphorus "winter" fertilizer to promote rooting in the fall and winter. There is no question that a late season fertilizer will promote rooting of cool-season grasses. The response, however, is due to nitrogen.

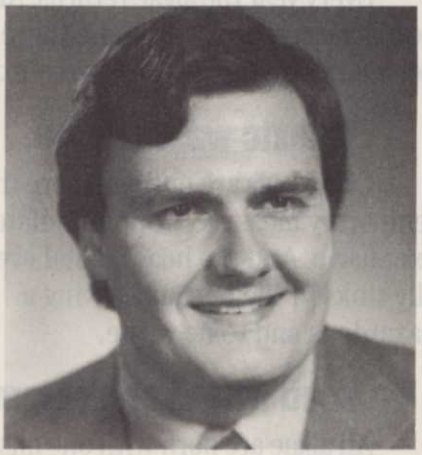
There is no evidence to suggest that phosphorus applications on established turf in the late season are beneficial. In fact, high P:K ratios may actually increase winterkill, especially with warm-season grasses. Phosphorus application should be based on a soil test.

Potassium applications in late season will improve winter hardiness. This is true, but optimum fertilizer ratios exist.

Late season fertilizers applied to cool season grasses should not exceed a 2:1 nitrogen/potassium ratio. The optimum ratio for warm season grasses (bermudagrass) is around 4-1-6 (like 16-4-25, 20-5-30).

Iron applications in the late season can also be beneficial. Cool-season grasses will remain dark green through much of the winter and early spring from a late fall iron application. Iron applied to warm-season grasses in the late season has more than aesthetic value. There is some evidence that iron will help improve the winter hardiness of warm-season grasses, and enhance recovery in the spring.

Iron is most effective and efficient if applied as a foliar spray. In short, plan now to improve the quality and health of our turfgrass areas by fertilizing in the late season. Take care in selecting the fertilizer sources and analysis, and be sure that you apply the fertilizer at the right time. **LM**



Dr. Hummel is associate professor of turfgrass science at Cornell University in Ithaca, N.Y.

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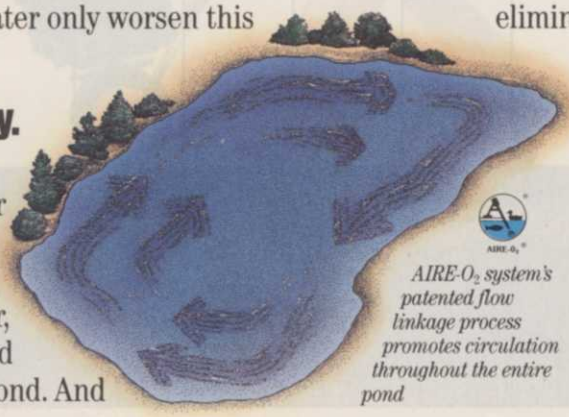

AIRE-O_2 system's patented flow linkage process promotes circulation throughout the entire pond

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GRUB BE GONE!

Grub control—especially with the most modern, effective insecticides—is a tricky business. Landscapers and lawn care operators are advised to meticulously follow these guidelines to avoid costly callbacks.

by Jerry Roche, executive editor

"It isn't as simple as everyone would like it to be," says Ohio State University's resident bug guru Harry Niemczyk. He is speaking, of course, about controlling lawn-munching grubs.

Keeping grub populations from damaging lawns has been, unfortunately, a hit-and-miss proposition among many professional lawn/landscape companies. Some of the problems are the fault of the applicator, some the fault of the homeowner and some the fault of the actual chemistry involved.

The first thing that should be done before applying a grub control insecticide is to check the soil pH and irrigation water pH, if possible.

"It is a problem," notes Dr. Michael Villani of Cornell University. "A lot of insecticides break down fairly rapidly in high or neutral pH."

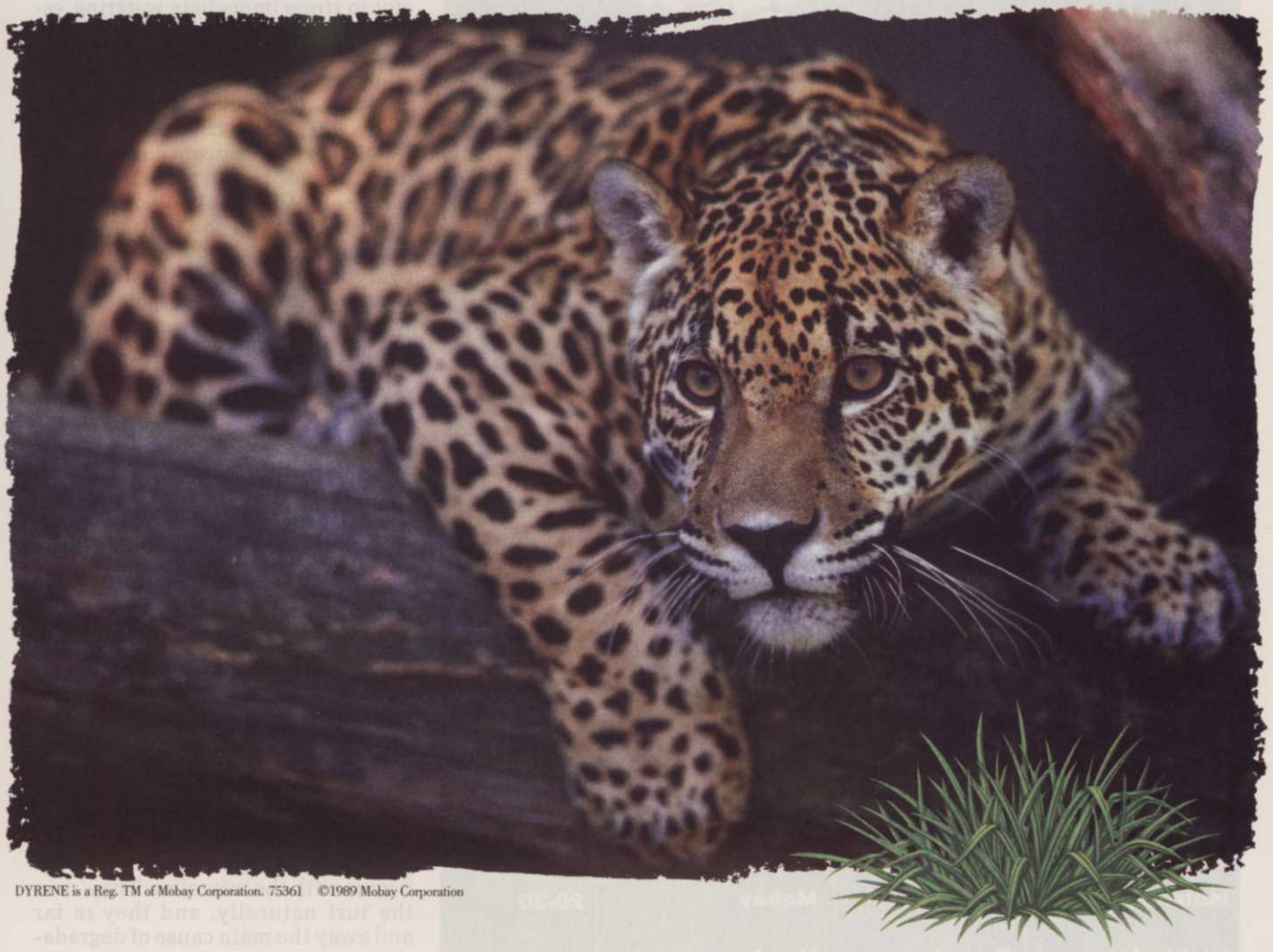
"Treating at the right time is also important," Villani adds. "People who treat in New York State in the spring have had trouble with control. And there isn't a manufacturer who will guarantee control of grubs if you put the material down in June or July."

With many new products, residual activity is not as long as older products, Villani continues, because of environmental considerations. This creates a smaller "window" of effective application. "Materials work under the best conditions, but there's very little margin for error now," says the Cornell entomologist. "You just don't have a leeway any more."

According to most experts in the North, early August is a perfect time to treat for grubs for control the rest of the year and into the next spring. Treatment can be made as late as mid-September. But because this is usually a time of extreme heat and drought that drives the grubs deeper into the soil, Niemczyk recommends "irrigation several hours before treatment and a thorough soaking afterward."

Insecticide applications made during the day—many times when homeowners are not present—also cause problems. If homeowners water at all, it is when they return at the end of the workday, at which time the insecticide may already be dried on the turf

Some Things in Nature Were Meant to Have Spots. Your Turf Just Wasn't One of Them.



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SOME INSECTICIDES FOR GRUB CONTROL IN TURF

COMMON NAME	TRADE NAME	MANUFACTURER	TOXICITY [1]
beniocarb	Turcam	Nor-Am	40-179
carbaryl	Sevin	Rhone-Poulenc	246-283
chlorpyrifos	Dursban	Dow	96-270
diazinon		Ciba-Geigy	300-400
ethoprop	Mocap	Rhone-Poulenc	62
isazophos	Triumph	Ciba-Geigy	40-60
isofenphos	Oftanol	Mobay	20-30
trichlorfon	Proxol	Nor-Am	250

Rat oral LD_{50} in g/kg[1]

Source: Farm Chemicals Handbook

leaf blade.

"You must insure proper watering," says Ciba-Geigy technical representative Don Wilson.

When he was working for ChemLawn, Wilson saw many instances when insecticides would be applied first thing in the morning but the client's landscaping service would mow and remove clippings before the lawn was watered.

"So we used to leave behind a packet of information with the invoice," Wilson remembers. "We'd put a fluorescent orange sticker on the invoice saying, 'CAUTION: Failure to water immediately will result in poor control.' It was very effective for us, especially with mole cricket control in Florida.

"The orange stickers are outstanding; they get the customer's attention and show him or her that you're concerned."

Wilson suggests knocking on the client's door before and after application of a grub control, if possible, to explain what applications were made. He also says that handwritten notes left behind work better than printed material.

"If a company really wanted to go above and beyond the call of duty," Wilson notes, "a phone call that night to remind the customer to irrigate helps."

Bob Staib, sales representative for Nor-Am Chemical, knows of some companies that call ahead of time to schedule grub treatments. That way, the homeowner will be home during treatment and can water immediately afterward.

"It behooves the lawn care operator to stress immediate watering, especially if the materials are liquid; granular materials aren't quite as immediate," Staib says.

Another problem is that no product yields 100 percent control.

"Eighty to 90 percent control is the norm," notes product specialist Tom Davidson of Rhone-Poulenc. "In the ag business, if you don't get 99 percent control, you're not doing well. Most everybody in the turf business has gotten used to 80 to 90 percent, but when you get this level on some populations, it just isn't enough." Davidson says that more than eight to 10 grubs per square foot will result in visible turf damage.

Another problem is what Dr. Niemczyk calls "microbial degradation."

According to Niemczyk and Dr. Adam Krause, also of Ohio State, "hungry" microbes in turf can adapt to residues of certain insecticides and quickly use the molecules of the compounds as an energy source. The phenomenon, seen before in herbicides, is known as enhanced microbial degradation.

"We found that microbes in the soil and thatch—fungi, bacteria and actinomycetes—are very important in the fates of insecticides," Niemczyk says. "Whenever you apply a compound to turf, degradation begins with the microbes. They're in the turf naturally, and they're far and away the main cause of degradation.

"But the bottom line is that once the adaptation is complete, applying the material to the turf is no longer effective."

Two ways for landscapers or lawn care operators to increase the efficacy of these insecticides are rotating them and timing their applications more accurately.

"Resistance to insecticides has not been a big problem," Staib says, "but it's probably a good idea to alternate products, especially those that have shown tendencies toward microbial degradation."

Says Niemczyk: "The whole phenomenon is still poorly understood. We have to find out a lot more to see if it's going to be a long-term problem."

The bottom line for effective grub control: test the soil pH, put the right material down at *exactly* the right time, and *make sure the client waters* as soon as possible after application. Those factors insured, adequate grub control is probably insured as well. **LM**

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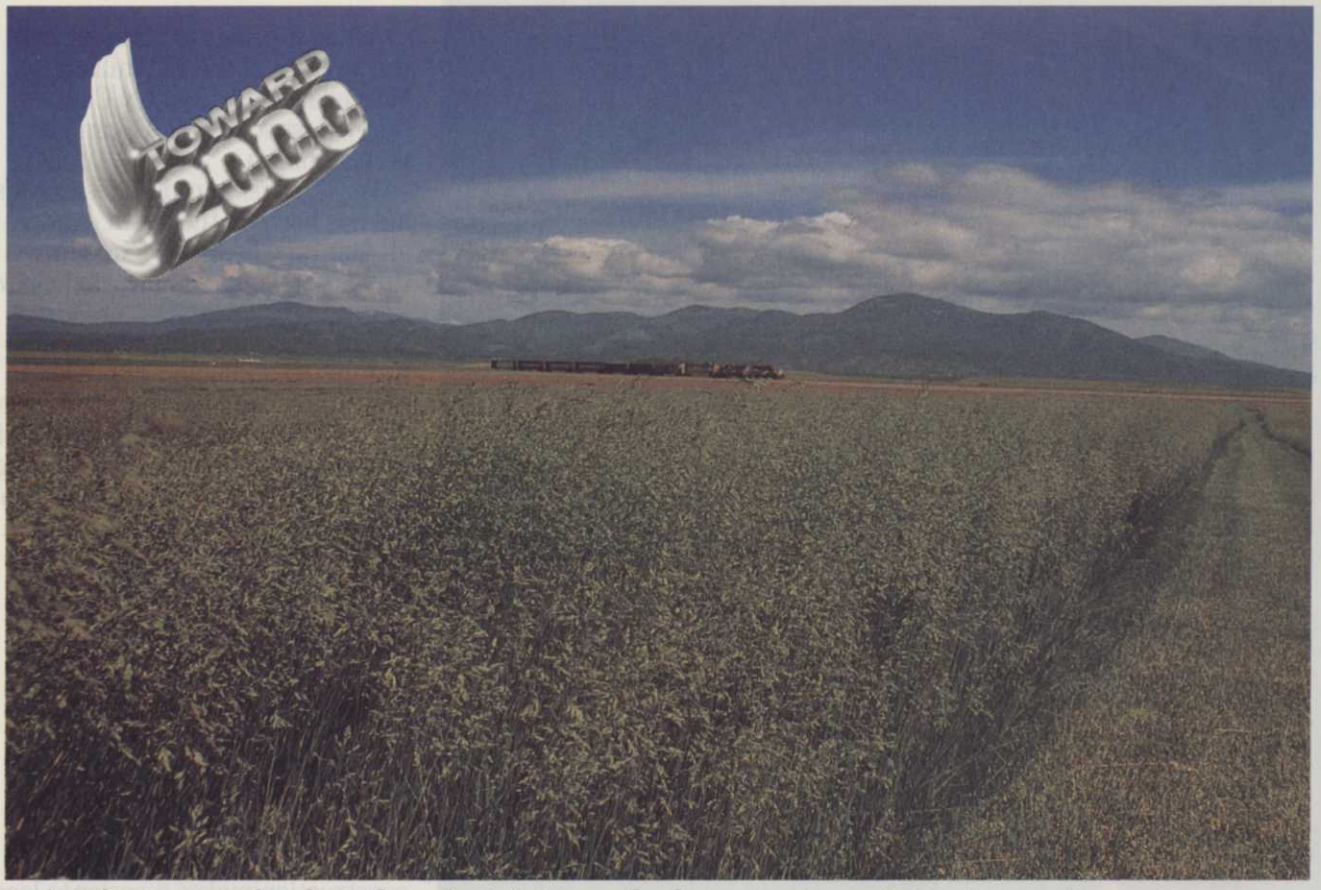

Early indications are that the 25 days of rain in May make the 1990 seed crop the best in several years. Oregon seedsmen say they'll need all the seed they can get to meet increasing demand.

SEED RESEARCH: OPENING NEW DOORS FOR THE TURF MARKET

A week in and around Oregon's Willamette Valley convinced our editor that already good turfseed is getting even better.

by Will Perry, managing editor

Three days and hundreds of turf plot squats into this year's annual trek through seed country, I began to wonder: *How many varieties of turf can there possibly be?*

My notebook was already full. I had traveled from Dawn to Midnight, across the Amazon to Aspen; I saw a Cowboy and an Apache; a Patriot near a Rebel; a Thoroughbred, Jaguar, Birdies and a Falcon. And for each there were dozens of other still nameless varieties waiting to compete for limited acreage this coming season.

Ongoing research in the Pacific Northwest—where most of the nation's turfseed is grown—may well mean denser, lower-growing, drought-, heat-, cold-, stress- and disease-resistant turf for landscapers and golf course superintendents.

Researchers insist the landscaper is, or will be, more likely to find a turf variety ideally suited for particular needs. And, unlike recent years, it appears as if there will be plenty of seed available in coming months (see LANDSCAPE MANAGEMENT's annual "Seed Availability Report" in the October issue).

New science

Proprietary seed is considered a new avenue of research, especially when compared to older agriculture research in crops such as corn and soybeans.

"When you look at turf breeding programs, you have to realize that they're only in their infancy," says Craig Edminster, marketing manager of International Seeds of Halsey, Ore. "Today's turf doesn't need as much fertilizer, requires less oxygen, can go for longer periods without mowing,

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Seed researchers continue to seek turf with the growth, color, and tolerance characteristics needed in the various climates and conditions throughout North America and the world.

Colored markers tell the researcher that a particular plant demonstrated one or more desirable traits.

and is adapted to wider areas than ever before. In addition, buyer sophistication is leading the industry into more specialized turf."

An example, says Edminster, is tall fescue, which has become an ideal turf in the transition zone because of its favorable shade, drought and temperature resistance. "Seven to ten years ago, there was no market for tall fescue. Today, more than 100 million pounds are produced annually," says Edminster.

"Turf-type tall fescues are going to a lot of places where they really had to fight to have a nice bluegrass lawn, like Virginia, New Jersey and Kentucky," says International Seeds plant breeder Steve Witten. "People in the Northeast had bluegrass lawns and everyone said, 'That's what a lawn is supposed to look like.' So everyone had to fight, fight, fight to have a nice bluegrass lawn. Now, with the improved turf-type tall fescues, you can have a nice-looking lawn without nearly as much hassle."

High tech seed

International Seeds has employed a computer at its Halsey facility to document each variety's performance under a variety of tests. Test results and breeding information are stored in a databank for easy access.

"The results of our work will come out in the next five to ten years," says Witten. "They may be good or they may be bad, but we plan on surprising quite a few people."

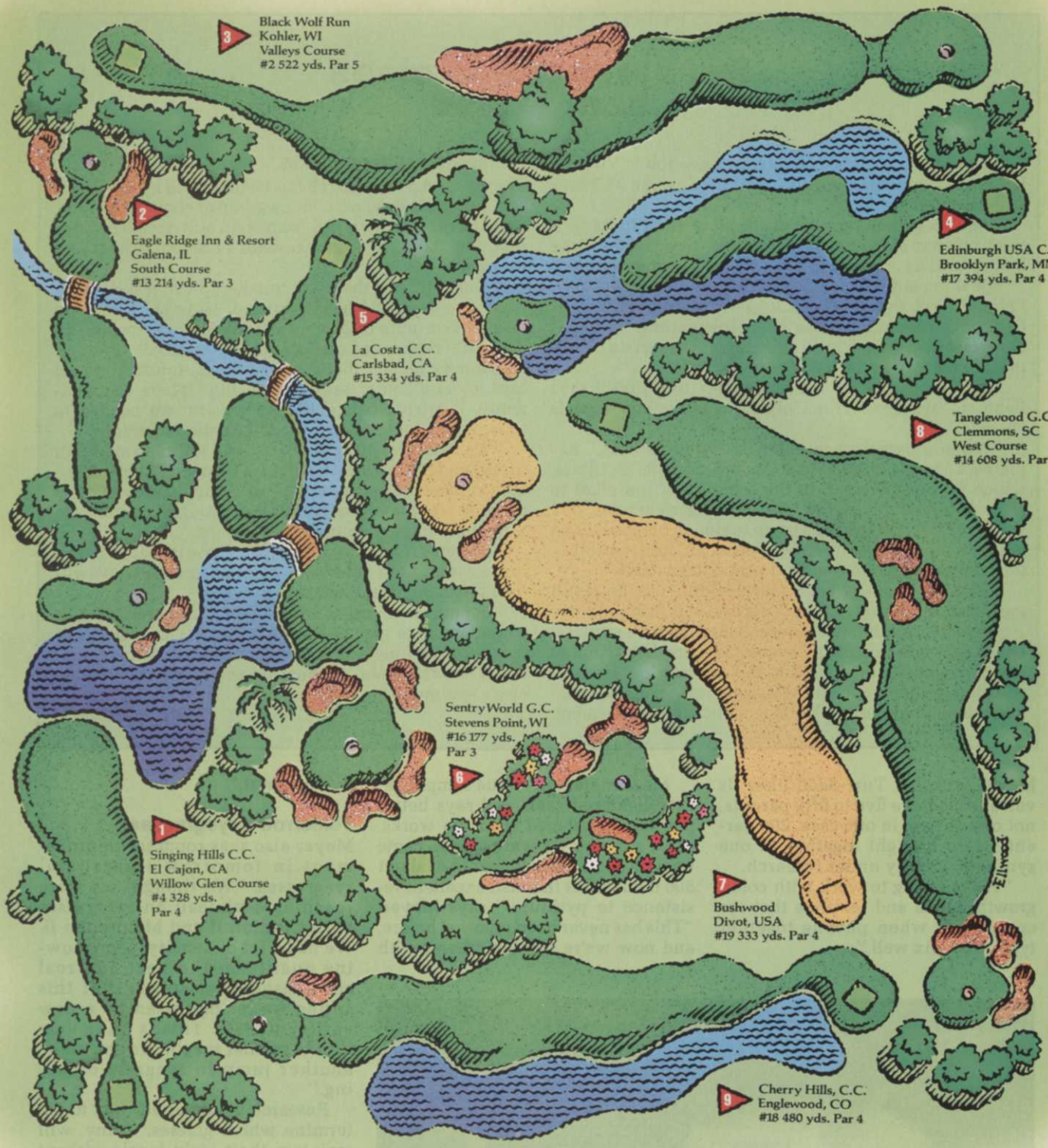
Dr. Bill Meyer, President for Research of Turf-Seed, also feels tall fescue and ryegrass development has been impressive.

"I think an amazing development in the past five years has been the continual improvement we've seen in ryegrass and tall fescue," says Meyer. "I think were going to continue to see these two species and we're getting closer to putting fine fescue in that category too."

Turf-Seed's research farm stretches over 105 acres in Hubbard that hold more than 10,000 turf plots. Meyer is taking advantage of every one, it would seem, because he's seeking a broad genetic base in the tall fescues and perennial ryegeasses under development.

"A lot of breeding work that has been done in the last few years has been based on inbreeding and trying to limit the number of parents. We're tying to broaden the number of parents we use, hoping that the turf will be more adaptable and have higher tolerances."

Dr. Doug Brede, research director, welcomes visitors to the Jacklin Seed Company's Idaho ranch.



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NORTHRUP KING

Researcher examines heat stress

One of today's leaders in bentgrass research is Virginia Lehman, who works with Dr. Milton Engelke at Texas A&M University.

The Texas bentgrass research program is in its fifth year. Lehman says it seeks to produce "new, seeded-type bentgrasses as opposed to older, vegetative types."

Speaking at the Loft's Seed Company 1990 Field Day, Lehman said the great challenge to herself and other bentgrass researchers has been the natural fact that bentgrass does best in mild climates, not the torrid conditions of many Southern golf courses.

"In Europe in July, the mean temperature is 60°," says Lehman, "whereas in the United States, the July mean is 70-75°.

"When grown at non-optimum temperatures," explains Lehman, "there is a drastic decline in tillers, which is then reflected in the inability of the plant to recover from damage: the roots no longer elongate, and you'll see the current roots begin to slough off. And when you lose the root system in bentgrass, you lose the ability to take in water, and the plant cannot cool itself."

The final result of bentgrass decline—or, the result most visible to the golfer—is a decline in putting quality.

"But the superintendent sees disease and weed invasion," Lehman says, "and more pesticides are then required to compensate for the biological deficiencies."

Lehman's quest is for cultivars genetically adapted to the environment, to reduce the dependency on management.

Concerned supers chip in

The Texas A & M research has been funded by the USGA and Bentgrass Research, Inc., a group of about 20 country clubs in the southern U.S. who want and need bentgrass that can stand up to the ravages of summer heat and drought.

"The ability of the plant to take up water is directly related to its actual heat tolerance," says Lehman, who also seeks a more traffic and salinity tolerant species, all the while retaining a quality putting surface.

Lehman recalls that five years ago, information on heat tolerant bentgrasses was lacking. "There was testimony, but from a scientific viewpoint, we needed to separate heat tolerance from dehydration tolerance.

"We have selected plants for their ability to maintain turgor under drought stress," says Lehman. "We've been able to increase the amount of water held in tissue by 10 percent; we're going to improve our drought resistance to ultimately improve our heat resistance."

Lehman's research continues, and she insists that testing is essential to determine plant adaptability; eyewitness testimony is not enough.

Lehman encourages independent research on golf course practice greens and nurseries. "Those are ideal places for turf managers to establish their own evaluations," says Lehman, "rather than rely solely on someone else's testimony."

—*Terry McIver* □

Meyer said that Turf-Seed likes its varieties to have five to fifty parents, not one or two. In one case, 200 parents were brought together in one synthetic variety under research.

"We're trying to work with color, growth habits and textures that are compatible when putting together types that mix well."

Meyer notes tall fescue's improved establishment rates and says better pythium resistance is in the works. "Last summer we were able to come up with about two clones out of about 500 tall fescues that had excellent resistance to pythium," says Meyer. "This has never been reported before, and now we're making crosses with that material."

Tomorrow's ryegrasses

Meyer also sees room for improvement in tomorrow's perennial ryegrasses. "We thought we were reaching a plateau on ryegrasses with Citation II and Manhattan II. We had a lot of density, good mowing quality in the heat and real good disease resistance. But this spring we're impressed by a new variety (GH89). This is an indication to us that maybe we can make another jump in ryegrass breeding."

Research is also under way to determine which grasses, if any, will maintain their yield levels without field burning. Field burning opponents are gathering signatures for two initiative petitions that would eliminate or drastically reduce the practice.

Lacking initiative?

"We (the seed industry) dodged a bullet last year when the legislature passed the field burning phase-out bill," says Jerry Pepin of Pickseed West in Corvalis, Ore. "The next battle is the initiative. If that gets on the ballot we're going to have to have a big advertising campaign to try to defeat it."

Fred Ledeboer of Turf Merchants has been researching the "dwarfness" of tall fescues to minimize clipping yields of turf on home lawns.

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Field burning opponents are gathering signatures to place one of two initiatives on the November ballot. One would ban field burning, propane flaming and stack burning by Jan. 1, 1991. A second, sponsored by Oregon Gov. Neil Goldschmidt, would rapidly phase down field burning, propane flaming and ban stack burning.

"Without burning, the fine fescues and bluegrasses would suffer," says Pepin. "They're so thatchy that you'd really have to use some heavy duty mechanical work to clean up a fine fescue field. You really need to burn it."

Jacklin Seed researchers, under the guidance of Dr. Doug Brede, are keeping their eyes on 42 varieties of Kentucky bluegrass planted in 1987. They're evaluating the effect burning, herbicide and insecticide application have on seed yields. The company, located in Post Falls, Ida., moved its research facilities to an Idaho ranch.

Turf trials added

Jacklin has also added four new turf trials. In addition to its five-year-old national Kentucky bluegrass trial and perennial ryegrass trial, the company has added national fine fescue and bermudagrass trials.

Steve Witten (l) and Stephen Johnson incorporated a computer databank to track turf for International Seeds.

Jacklin's Virginia Kanikeberg is studying the feasibility of seed priming, a process that allows seed to germinate more quickly. Priming involves exposing the seed to a solution that allows them to imbibe just enough water to initiate the early stages of germination.

"In places where the growing season is short, grass seeds that germinate faster can take better advantage of the weather and produce more seed heads," says Kanikeberg.

In Tangent, Ore., Fred Ledeboer, researcher at Turf Merchants, asked field day attendents this now-familiar question: "What are we going to do with the clippings?"

Ledeboer has been comparing the clippings weight of tall fescue to determine growth rates and see which varieties produce the least amount of clippings.

"There are two phenomena that could be called 'dwarf,' says Ledeboer. "One is the total plant height at maturity. The other is in the turf, that is, reduced foliage elongation and reduced clippings. With the latter, the practice of mowing on a weekly schedule will change." **LM**

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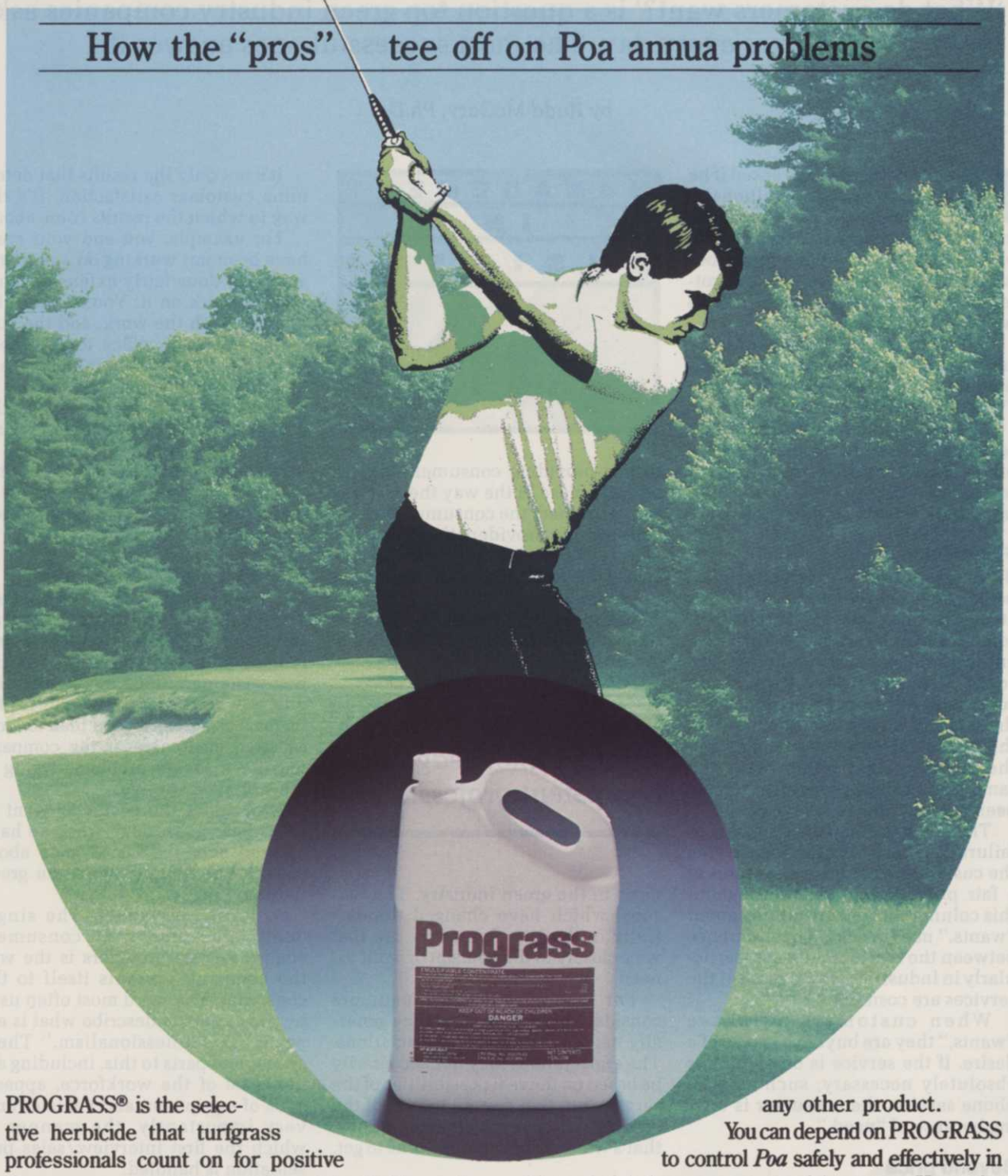

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Circle No. 124 on Reader Inquiry Card

WHAT DO THEY WANT?

'What do customers want?' is a question top green industry companies ask themselves every day. The most successful ones answer it.

by Rudd McGary, Ph.D.

Henry Ford was once asked if he would have been a millionaire had he not invented the automobile production system. He replied, "Yes. I would have found out what the customers wanted and gotten it to them at a fair price." That's why Ford was a millionaire.

But some obvious questions can be asked about the solution above, brilliant as it is. The big question is: "What *do* consumers want?"

The green industry offers certain services to the public, but there is more to this industry than treating lawns, mowing grass, working on trees and designing outdoor space.

Fair service is key

Basically, all green industry companies offer nearly identical services at nearly the same prices. Granted, some companies are better than others in their technical ability to perform the services, and some companies are more professional. But there is still a very fine line between the successful, growing company and the company that either stays the same size or disappears after having been open for only a few years.

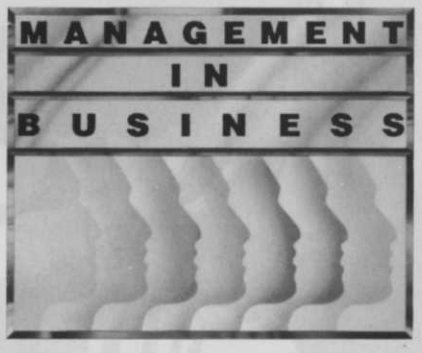
The key to a company's success or failure goes back to Ford's idea: giving the customer what he or she wants at a fair price. (Remember throughout this column that we are talking about "wants," not "needs." The difference between the two is significant, particularly in industries where some of the services are cosmetic.)

When customers purchase "wants," they are buying because of a desire. If the service is one which is absolutely necessary, such as telephone service, the consumer is buying because of "need."

Beyond price

The reason this is important is because the consumer in the green industry can make choices about how he/she wants to be serviced—and one of the choices is to not take a service at all. This is very different from those services which are "need" based.

Given the fact that the good companies providing consumer services are very close in the way the services are performed, the consumer then selects service providers through other factors. Then, job performance becomes an expected part of the service to be bought.



For more than a decade, research has been done on why people buy services in the green industry. The reasons, which have changed dramatically in the past five years, are tied very closely to the concept of want vs. need.

What does the customer want? A knowledgable, competent professional.

For example, when consumers consider buying a service, they generally set up a group of expectations. The expectations may not necessarily be based on the real possibilities of the service, but that doesn't matter. If the consumer has a set of expectations, that's what the consumer wants to get.

Results tell all

On the other side are the results: the final outcome after the service has been performed. I have been suggesting for some time that the difference between the consumers' expectations and the results is what causes problems in the service industries. There is, however, another part to this.

It's not only the results that determine customer satisfaction, it's the way in which the results come about.

For example, you and your crew have been out working on a property and have done fairly extensive landscaping work on it. You're not quite finished with the work, and the customer calls your office to ask about something. The person in the office is having a bad day and is obnoxious to the caller. No matter how good the property looks, the consumer isn't going to be satisfied with the way in which the results come about. This becomes important in industries where there are more and more good companies working.

Stand above the rest

The work can be done by a lot of people; it's the way in which the overall results are accomplished that determines whether or not you have a satisfied customer. Since much green industry work depends on referral for its marketing, it's a good idea to have satisfied customers or the company will have severe problems trying to grow or even survive.

What does the customer want in 1990? Let's go through what we have learned over the last decade about consumer expectations in the green industry.

1. Professionalism. The single dominant factor when consumers choose service providers is the way the company presents itself to the consumer. The word most often used by consumers to describe what is expected is "professionalism." There are several parts to this, including appearance of the workforce, appearance of equipment and vehicles and, very importantly, the manner in which the first interview/sales presentation is handled.

Office staff cooperativeness and how they handle the customer is also very important. Companies using answering machines are not thought of as professional and therefore lose some business. Companies where the office staff isn't polite or helpful are also considered out of the "professional" category. (In general, this is a

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Finelawn I	5.6	Bonanza	4.8
Trident	5.4	Olympic	4.8
Pacer	5.3	Maverick	4.7
Mustang	5.3	Willamette	4.6
Apache	5.2	Rebel	4.5
Tempo	5.1	Clemfine	4.4
KY-31	5.0	Brookston	4.4
Falcon	5.0	Johnstone	4.0
Houndog	5.0	Kenhy	3.4
Adventure	4.9		

Data from USDA National Turfgrass Evaluation Program

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Brown Patch Ratings 1-9 9 = No Disease

Name	Mean	Name	Mean
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Adventure	6.2	Finelawn 5GL	5.5
Jaguar	6.1	KY-31	5.5
Rebel	6.0	Mustang	5.5
Pacer	5.9	Bonanza	5.5
Maverick	5.8	Trident	5.5
Falcon	5.8	Johnstone	5.5
Clemfine	5.7	Finelawn I	5.3
Apache	5.6	Kenhy	5.0
Tempo	5.6	Willamette	4.9
Olympic	5.6	Brookston	4.3
Houndog	5.6		

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feeling as much as a concrete category, but without the feeling of a professional company, the company isn't going to sell much.)

2. Knowledge. This is particularly important in the beginning stages of a customer/service company relationship. The customers want to be confident that service providers have a strong understanding of how to complete the job. In addition, it is important to the consumers that the service providers are able to problem solve quickly.

One other consistent comment from consumers is that they don't want to be presented with too much technical talk. While consumers want information, they don't want a complete doctorate in green industry technology. The complaint is that some personnel seem to want to overwhelm consumers with technical information.

3. Communication. This very vague word translates into two different areas of consumer concern. The first is the way the customer is treated on the phone—politeness is a necessity. No matter how well the company can provide the service, people who aren't polite on the phone kill sales opportunities.

The second area deals with problem solving. Customers who give strong referrals mention the companies' abilities to solve problems. They say that the people identify the problem, tell them how they are going to deal with it, do what needs to be done, and then call afterward to make sure the customer is satisfied. Sound like a lot to make a customer happy? How big do you want your company to be?

Looking at factors

There are a lot of other factors. Certainly price is important, but if the other three things listed above are not available, the price doesn't matter at all. People buying on low price alone are a small group, and generally not a group that you want to deal with anyhow.

What does the customer want? The customer wants a *service* company, not a company that thinks that results alone are all that matter.

What does the customer want? To be treated as if they were important to the company. (They are: they pay all the bills.)

What does the customer want? The customer wants a professional, competent, knowledgable company.

What does the customer want? The customer wants results and more. How those results come about are as important as the results themselves.

Remember Henry Ford? This is what the customers want. And they're out there waiting to make you a millionaire. **LM**

Rudd McGary, Ph.D., is a senior consultant with All-Green Management Associates in Columbus, Ohio.

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This year's ALCA/PGMS Landscape and Grounds Management Conference features the latest information on a multitude of topics including: Training for the '90s, Customer Service, Plant Material That Warrants Attention, Maintenance and Cost of Utilizing Wild Flowers, Sports Turf and Strategies to Increase Your Bottom Line. The Keynote speaker, Allan Cimberg, will give a presentation, *'How to Sell in Tough Times to Difficult People.'* Mail the coupon below for more details and registration information.

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GREEN INDUSTRY EXPO/90

IN CONJUNCTION WITH PLCAA EDUCATIONAL CONFERENCE AND ALCA/PGMS LANDSCAPE & GROUNDS MANAGEMENT CONFERENCE

Bio-stimulants: new management tools

According to research under way at several major universities, bio-stimulants can greatly improve root growth and stress tolerance. In addition, proper use of these compounds could address environmental problems associated with groundwater contamination, especially from excessive nitrates.

Bio-stimulants are mostly natural products that improve, accelerate and have a positive effect on plant growth. Some of these materials are natural with no added chemicals or hormones, while others contain synthetic plant-altering or growth-altering ingredients.

Dr. Michael Goatley, assistant professor of agronomy at Mississippi State University, is studying the effects of bio-stimulant use on warm season turfgrasses such as bermudagrass, St. Augustine and zoysiagrass. Two significant indications, he says, are that bio-stimulant use enhances root growth and helps turf hold up under stress situations.

"Theoretically, bio-stimulants might be useful for golf course superintendents who manage sand-based greens composed of bermudagrass or bentgrass," Goatley explains. "Because of stronger, more developed root systems, turf would better endure stress caused by, say, a severe drought."

Dr. Raymond Poincelot of Fairfield University is testing bio-stimulant effects on a wide variety of plant species.

Apply before dormancy

The most measurable response of warm-season turf grown under suitable moisture and fertility conditions to bio-stimulant application comes when the material is applied in late September or early October as turf begins to prepare for winter dormancy, the researcher says.

"When a bio-stimulant is applied at this time, we see more enhanced root development late in the growing season," Goatley continues. "This could result in better carbohydrate storage and preparation of plants for winter."

The primary bio-stimulant material that Goatley is examining in his research is a mixture of humic acids derived from peat moss, kelp and seaweed extracts, chelating agents, natural soil chemicals, co-enzymes and micronutrients like iron, manganese and boron. This formulation is sold under the trade name of Roots' Root Growth Enhancer.

The product's manufacturer, Roots, Inc. in New Haven, Connecticut, has also recently developed a biostimulant formulation containing chelated iron specifically for use in turf. The new product is called ironRoots.

Goatley says that use of bio-stimulant combined with iron could also enhance spring green-up as temperatures warm and spring dormancy breaks.

"The biggest advantage of using a bio-stimulant such as Roots with added iron would be an immediate color response that wouldn't be associated with a resulting flush of shoot growth," Goatley explains.

The researcher says that lush turf growth following early, heavy applications of nitrogen often leave turf especially vulnerable to injury from late-season frost.

Sod applications

Dr. R.E. Schmidt, professor of agronomy and a turf ecology and physiology specialist at Virginia Polytechnic Institute in Blacksburg, is also studying several bio-stimulant compounds on a variety of turf species, including warm and cool-season grasses.

"Production of bentgrass sod for golf greens is on the increase, and we're seeing more demand that producers treat with bio-stimulants before shipping to this market," says Schmidt, whose research focuses primarily on sod production.

"Some golf courses are now able to sod greens and have them putted on in a few weeks' time when bio-stimulants are used."

Use of bio-stimulants might also help solve problems associated with groundwater contamination by nitrates. By combining bio-stimulants with nitrogen, fertilizer rates might be reduced because uptake efficiency would be increased.

"Of course, you'd never substitute a bio-stimulant for an essential plant nutrient such as nitrogen," Schmidt stresses.

Researchers still have much to learn about bio-stimulants, but these materials are already starting to find their way into the commercial mainstream.

To date, bio-stimulant compounds have been used commercially on golf courses, in parks, nurseries and cemeteries, and for sod production. In many cases, they have been used with noticeable results.

"People should not anticipate bio-stimulant use as being a cure-all," Schmidt cautions. "Based on my research thus far, I would say that bio-stimulant use can be a good insurance policy."

Another university scientist who finds bio-stimulant research encouraging is Dr. Raymond Poincelot at Fairfield University in Connecticut. Much of Poincelot's research involves plants such as marigolds, petunias, azaleas, rhododendrons, poinsettias and chrysanthemums.

Horticultural research

With chrysanthemums, for example, Poincelot has observed improved flowering when the Roots bio-stimulant is applied to the plant. "This species usually flowers only at the top of the plant, but some of my experiments have greatly increased lateral flowering," says the researcher, who is author of four books on horticultural topics and writes extensively for *The New York Times* and other publications.

Poincelot is also examining bio-stimulant use on cacti and citrus-species that are difficult to propagate.

"Based on what we've seen so far, there is a definite, positive effect on rooting of cuttings and germination of seed," he says. "But, this effect varies greatly depending on plant species." **LM**

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Circle No. 118 on Reader Inquiry Card

Wildflower benefits always in bloom

by Diane Wilson, ecologist, Applewood Seed Company

Mike Kropp, grounds maintenance superintendent for the City of Rock Hill, S.C., once decided to plant wildflowers in narrow medians too small to mow safely. The tactic worked.

The wildflowers, which he obtained from Applewood Seed Co., provided bright color during the spring and summer and resulted in a substantial cost savings for the city.

Kropp views flowers as a safe and economical adjunct to turf. "For every dollar spent (on wildflowers), we save an estimated $3."

Wildflowers are great additions to out-of-play areas, knolls between greens, doglegs on fairways, in the roughs and near tees.

Mike Kosak, superintendent at Forest Highlands in Flagstaff, Ariz., developed a seed mix of wild grasses combined with five percent of Applewood's mountain mix.

"The response was overwhelming," says Kosak. "People notice the wildflowers even more than they notice the greens."

Mark Raab, ground supervisor of Maryland's Howard County Bureau of Parks, claims that in addition to a substantial increase in wildlife, maintenance costs have been reduced "substantially" since he's planted wildflower meadows. Cost cutting results in less fertilizer, herbicide, labor and equipment use. "Our costs in 1987 for maintaining turf was $690 per acre per year, verses $31 per acre for wildflowers. The only maintenance performed on our meadows is mowing once per year," says Raab.

Wildflowers provide scenic refreshment between play at the Port Ludlow Golf Course, Port Ludlow, WA.

Steps to establishment

To achieve good wildflower establishment, Raab first uses Roundup to clear the area of vegetation. Dead plants are mowed low and raked off. A rake or power dethatcher is then used to scarify the soil down to a depth of about ¼-inch. The seed is mixed with a bulking agent such as sand, Turface or kitty litter. One part seed to three parts bulking agent is a satisfactory ratio.

The seed/bulking agent mix is sown with a hand-held rotary spreader. Seed is lightly raked into the soil, or a power dethatcher may be used in large areas.

Fiachra, a large landscaping firm with many northeast offices, has hydroseeded Applewood's wildflower seed in numerous projects.

"Commercial customers and residential developers will generally use wildflowers in buffer areas or intermediate zones found between the formal landscaped area and a property line or stand of woods," says Carole D'Adamo of Fiachra.

"Retention basins have also been used for wildflower locations," she adds. "It's been an aesthetic alternative to the traditional grass vegetation usually found in these areas."

Two-step hydroseeding

According to D'Adamo, wildflower seed should be hydroseeded differently than grass seed.

"The planting method used in hydroseeding is a two-step process," she says. "First, the seed is sprayed on with a minimal amount of fiber mulch, just enough for marking purposes. After it has had time to dry, a second application is sprayed on with mulch, tackifier and 0-36-0 plus sulfer fertilizer. The total amount of mulch used is 1200 lbs./acre with only about 300 lbs. used in the first application. Due to the small and somewhat fragile characteristics of wildflower seed, it is important to get seed to soil contact.

"If the full complement of mulch were used in one application, a lot of the seed would get tied up in the paper mulch and never have a chance to germinate."

Blending in

Barb Steinmeyer of Habitat Landscapes, Inc., Aurora, Colo., has a large clientele from a residential neighborhood with extensive areas of native vegetation such as scrub oak and ponderosa pine. Her customers wanted to try wildflowers because traditional plantings would look out of place. "Customers like the masses of different colors," states Steinmeyer, "and they like the fact that they blend in with the rest of the natural environment."

Steinmeyer reseeds during the second and third years with an annual/perennial mixture at one-half the original planting rate.

Reseeding the second and third year helps to control weeds, cover bare spots, and provide additional color from the annuals. Perennial wildflowers usually attain their full growth and begin to bloom in 2-3 years. **LM**

The hottest twosome in golf.

That twosome is Gator turf-type perennial ryegrass and Cobra creeping bentgrass.

Gator is the elite, moderately dark green ryegrass that has exhibited superior heat and cold tolerance. It's a very erect, semi-dwarf, densely crowned variety, which is widely used for durable permanent turf in the Northern U.S. and for overseeding dormant Bermuda grass in the South.

Cobra has a semi-erect growth habit, is uniformly dark green and has shown unparalleled resistance to heat and other forms of environmental stress. It is highly recommended for greens, tees and fairways. Cobra was developed through the cooperative efforts of Rutgers University and International Seeds, Inc.

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Circle No. 111 on Reader Inquiry Card

PRODUCTS

Bio-groundskeeper works to reduce thatch

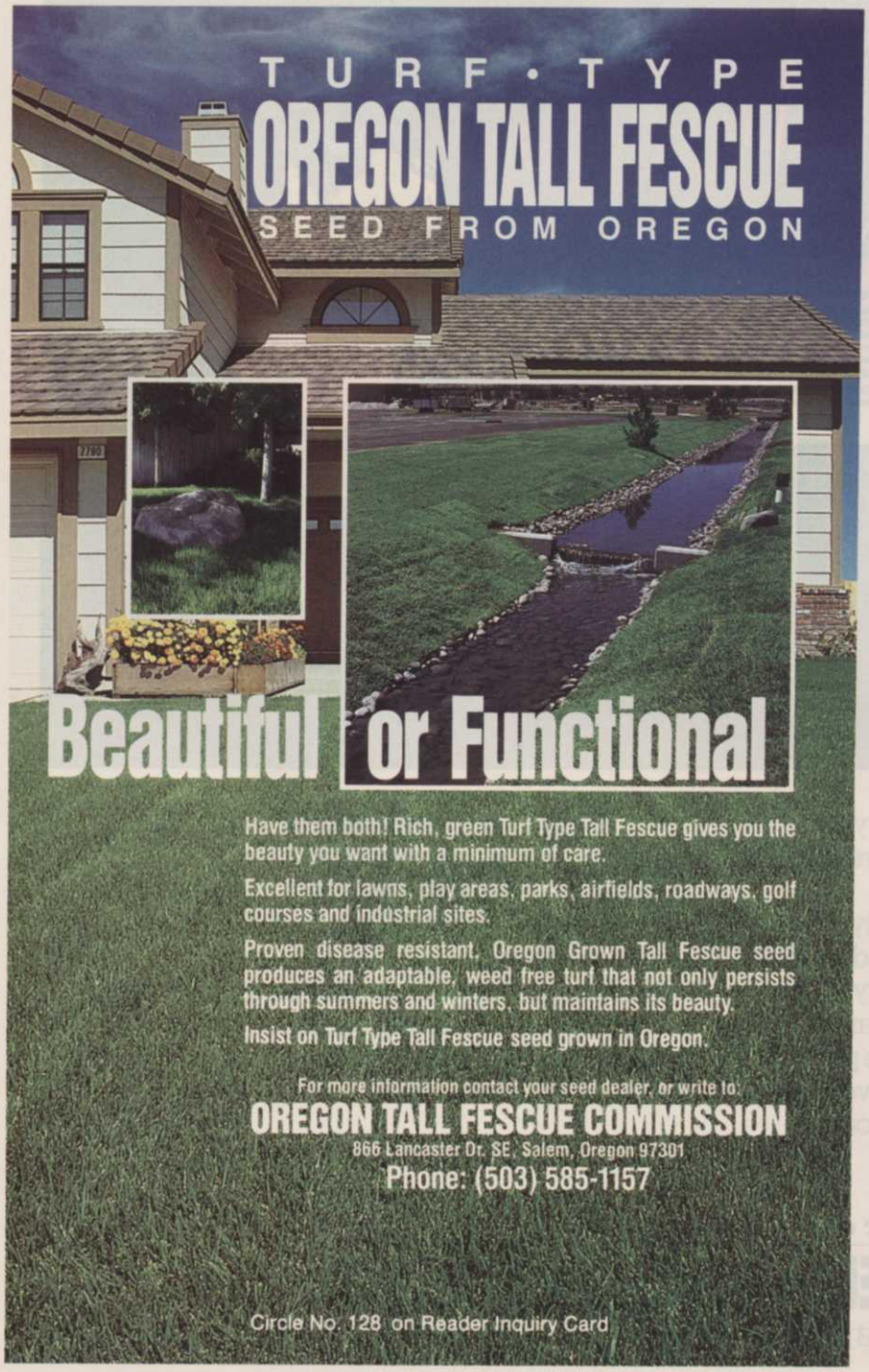
KLM Bio Systems of Bloomington, Minn., has added convenient measuring devices to its 32-oz. starter size bottles of liquid thatch reducer.

"There is quite naturally a lot of interest in totally organic lawn care and turf products these days," says Paul Marrs, company president.

"We've included what we call the 'accurate measurer' on our smaller bottles in answer to the demand for more controlled testing on smaller plots."

Bio-Groundskeeper for Thatch Reduction contains a concentrate of microbial extracts and bio-catalysts that aid and accelerate natural decomposition of thatch. KLM reports that the totally organic liquid thatch reducer has proven to be highly successful in studies at Michigan State University's department of botany and plant pathology. Researchers found the product caused a "significant decrease in thatch in less than 90 days."

Circle No. 191 on Reader Inquiry Card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Phone: (503) 585-1157
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Rock formations add beauty to landscapes

As the rock and waterscape industry develops into the '90s, new designs, technologies and construction methods are coming to be realized.

Macaire, located in Los Angeles, is one of the leaders in rockscaping. Landscape specialist Ken Macaire designs rockscapes for residential and commercial clients in Southern California.

Features of Macaire designs include individually designed features and innovative looks, leach lines to create many levels of water flow, sculptured rockwork and plants designed directly into the rockwork.

Circle No. 192 on Reader Inquiry Card

Pour spout is designed for safety, convenience

The Sure Pour pouring spout is an innovative new product designed to be a safer, more convenient way of filling power units to which fuel must be transported. The patented Sure Pour spout can be inserted into the gas tank before fuel starts to flow. Simply push down for the spout valve to open.

Fuel flows until the tank is full, then automatically shuts off to prevent overfilling.

While fuel flows, vapors are venting through the spout's own venting system back into the gas can which aids in eliminating vapors escaping into the atmosphere. When the spout

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June 1, 1990

AN OPEN LETTER TO ROADSIDE VEGETATION MANAGERS FOR DOT: TURNPIKES, COUNTIES, AND CITIES

If your vocation is roadside vegetation - landscaping or maintenance then we believe the National Roadside Vegetation Management Association should be of interest to you.

We meet once a year and our next conference is scheduled for Sept 25-27 at the Albuquerque, NM Hilton. NRVMA was formed in 1984 to exchange ideas, opinions and experiences, to discuss vegetation management activities regarding safety, functional and operational characteristics, economy, roadside beautification and aesthetics, and ecological soundness; and to promote more and better coordinated efforts among those interested and engaged in roadside vegetation management. Every effort has been made to hold costs down, to fit roadside per diems.

There are 4 types of memberships - Roadside Managers, Associate, Supporting and Sustaining. The two primary memberships are Roadside Managers at a cost of $35 per year and Associate which costs $45 per year.

THE INGREDIENTS OF A CONFERENCE

- **Educational lectures and talks on the topics most relevant to roadside management;**

  Landscaping & Beautification
  The Use of Wildflowers
  Herbicides and their use
  Managing Roadsides in the Nineties
  Roadside Environmental Impact Statements
  Roadside Management Equipment
  Endangered Species and Ground Waters
  Storm Water Management & Erosion Control and Their Effect on Programs
  Roadside Parks
  Applicator Training

- **Equipment show/product exhibits. Forty-eight major suppliers exhibited their products at the last conference.**

- **"Kickoff" Luncheon sponsored by DuPont; Awards Luncheon by Monsanto.**

- **Regional Sessions**
  The country is divided into 3 geographical areas(N, S, W) and a 2 1/2 hour time period is scheduled so that roadside managers with common problems can exchange ideas/information on the hows and whys of their programs.

- **Roadside Excellence in Roadside Management**
  NRVMA cooperation with Monsanto sponsors a 4 category program to determine the most successful roadside managers in the U.S. The contest is categorized: State Highways and Turnpikes, Counties, Cities, and Roadside Support. Winners are announced during a special luncheon and then they are allowed 25 minutes of time on the program to review their winning programs. This is followed by national publicity in the major roadside magazines and local publicity. The objective is to upgrade the roadside management practices and generate support for the industry

- **Industry Night - Social evening sponsored by suppliers**

We are confident NRVMA has plenty to offer vegetation managers and we look forward to "seeing you in Albuquerque".

1990 Officers are: Sharon Gabel, Secretary, Monsanto; Edward C. Dixon, President, Alabama Highway Dept; Benny Roybal, Vice President, New Mexico DOT; and Richard Hendler, DOW/Elanco, Treasurer

Sincerely Yours,
Turney J. Hernandez
Executive Secretary

For additional information, cut out and mail to:

T.J. Hernandez
309 Center Hill Road
Wilmington, DE 19807

I am interested in Membership:
- ☐ Roadside (City, County, DOT) $35
- ☐ Associate (Supplier, Press, Applicator) $45

Circle No. 123 on Reader Inquiry Card

is removed from the tank, the valve closes and seals.

Circle No. 193 on Reader Inquiry Card

Snowblower line fits commercial, home needs

Kubota Tractor Corp. has expanded its line of snowblowers to include the G2500, the G2505, the B2551 and the B/L2563. All are designed to fit Kubota compact tractors in both its

home and commercial categories. These models are built for big jobs, such as road clearing, parking lots and driveways.

The G2500/G2505 front-mount snowblowers for Kubota's G-Series lawn and garden tractors are available in 38-inch and 48-inch widths, with a manual or hydraulic lift. A manual chute rotator allows for side-to-side and downward direction control.

The front or rear mount B2551 snowblower has a 51-inch cutting width and fits tractors from Kubota's B-Series line for lawn, garden nursery and vineyard use. This blower features a 14-inch diameter auger and a high speed blower.

Circle No. 194 on Reader Inquiry Card

Sweeper cleans large turf areas, can dethatch

A Jacobsen 720 sweeper is designed for cleaning large turf areas.

The unit cleans a five-foot wide path, and comes with a five cubic-yard hopper.

The sweeper has a rubber fingers pick-up system, to remove wet and

dry leaves, branches, clippings, pine needles, trash and other debris.

An optional thatcher-thinner dethatches turf as it's cleaned.

Galvanized steel construction makes the sweeper box virtually maintenance-free.

Circle No. 195 on Reader Inquiry Card

Turf products packaged in durable material

As the need and market for environmentally sound products continues, Ringer Corp. has improved the packaging for its line of natural professional turf and landscape products.

The new Ringer bags are made with a more durable material that's better stitched to withstand the demands of commercial applications.

The bags are also printed with a lower dye content and the directions have been simplified.

The new packaging can be found on Ringer's comprehensive line of natural commercial products, including Flower & Foliage, Greens Super, Greens and Turf.

The products are formulated for a wide variety of granular applications for golf course, general turf and horticulture uses.

Circle No. 196 on Reader Inquiry Card

New company makes lawn hydroseeders

Signature Lawns of San Mateo, Calif., is new to the hydroseeder industry. It

markets the Techni-seeder.

"As competitive as the landscape business is, I'm amazed at the amount of money a contractor can make with a Techni-seeder," says company president Daniel Munier.

The Techni-seeder is a state-of-the-art hydroseeder which boasts the most convenient, effective and profitable means for establishing residential and small to mid-size commercial lawns.

The unit is a low maintenance, one-man operation. Features include self-cleaning pump and hose.

Circle No. 197 on Reader Inquiry Card

New perennial ryegrass a very tolerant plant

Accolade is the newest exclusive Scotts brand seed variety.

Accolade's most notable features are good winter color, early spring greening, good drought and cold tolerance and good seedling vigor.

Accolade also has a high endophyte level, which results in excellent tolerance to a wide number of surface-feeding insects. Scott's Professional Business Group believes that these characteristics make Accolade a welcome component in any mix requiring perennial ryegrass.

Circle No. 202 on Reader Inquiry Card

Controlled release tablets contain major nutrients

Sierra Controlled Release Fertilizer Tablets are bonded pre-measured amounts of Sierra Controlled Release Fertilizer which continuously release major and minor nutrients from every single prill.

With an N-P-K analysis of 16-8-12, these 7.5 gram tablets have an 8- to9-month longevity at 70° average soil temperature.

Sierra tablets provide a combination of Osmocote coating to N-P-K and Micromax micronutrient technology.The two are combined in an even more convenient, dependable single application form.

Circle No. 198 on Reader Inquiry Card

Four proprietary varieties released by research co.

Seed Research of Oregon announces the release of four high quality, proprietary turfgrass varieties.

SR 4200 is "the next generation in dwarf-type perennial ryegrasses," and is a leafy, fine-textured grass with high tillering ability and bright, dark green color.

SR 5000 chewings fescue was bred for a dark green color, high quality appearance and improved summer performance.

SR 8200 is Seed Research's newest tall fescue. The slower growth rate will reduce mowing requirements throughout the growing season.

SR 2000 Kentucky bluegrass is a low growing bluegrass with a dark green color, developed to have mod-

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Circle No. 101 on Reader Inquiry Card

erately wide leaves so it can be readily mixed with fine-textured tall fescue varieties.

Circle No. 199 on Reader Inquiry Card

New way to protect, store fertilizer bags

Arrowhead Plastic Engineering, Inc. of Muncie, Ind., introduces the "Dri-box."

The Dri-box is designed to store and protect dry bags of fertilizer on open-bed trucks.

Molded from durable, corrosion-resistant polyolefin material, the Dri-box features a continuous seal for weather resistant storage and transport. Manufactured with stainless steel hinge, latch and hardware.

The unique clam shell design and gas cylinders allow for easy access for loading and unloading dry bags of fertilizer. The padlockable latch prevents unauthorized access to tools or chemicals.

Arrowhead says the Dri-box also provides a safe, convenient method of storing empty bags until they can be disposed of properly.

Circle No. 200 on Reader Inquiry Card

New turfgrass varieties resist disease better

Crew-Cut dwarf-type tall fescue and Vantage perennial ryegrass are new turfgrass releases from Proprietary Seeds, Inc.

Vantage is described as an improved turf-type perennial ryegrass that demonstrates resistance to a broad spectrum of diseases, but is exceptionally resistant to stem rust.

Proprietary Seeds reports that seed yields are also improved, which means there will be a reliable supply, competitively priced.

Crew-Cut shows a dramatic reduction in vertical growth rate, along with narrower leaves, increased density and upright growth habit.

Crew-Cut will be an excellent option for Kentucky bluegrass and perennial ryegrass users that demand outstanding aesthetic qualities but want the reduced maintenance characteristics of turf-type tall fescue.

Circle No. 201 on Reader Inquiry Card

Fine Fescue Defined

What are Fine Fescues and why are they so important to turf managers?

Our Fescue turfgrasses are part of most every park, golf course, industrial campus, athletic field, condominium commons and home lawn from the transition zone, Northward.

But, many people are not aware of that. Perhaps we are the most overlooked turfgrass in existence.

We feel that Fine Fescues are the best turf investment a grounds manager can make. And, we'd like to point out *why.*

Fine Fescues are *real* grass. And, as with all living things, there is give and take. Sure, our Fescues take water and some maintenance, but they are better *givers.* Our natural grass turns noxious gases into oxygen and is a natural air conditioner for turf users.

We feel that while artificial turf has its place on locker room floors, it has no business where *real* people work, play and relax. Our grass is just *naturally* more refreshing.

Our Chewings (Festuca rubra commutata) and creeping red (Festuca rubra rubra) Fescues are rather unique when compared with other turfgrass species. Although they have most of the features of other cool season grasses, Fescues have several distinct benefits worth noting.

Fine Fescues are low maintenance. Our varieties require less fertilizer and water than other species. That's a big *plus* at today's water, fertilizer and manpower prices.

Fine Fescues fare well around trees. It seems our grass doesn't need as much sunlight, water and nutrients as other turfgrass species. Because Fescues don't compete with trees for these important elements, they're called *shade grass.* Our Fescues don't creep into flower beds, nor crowd out other species in a mixture.

And, because they're Oregon grown, our Fescues germinate, adapt and perform better than imported types.

You'd expect to pay a fortune for such a turfgrass, but Fescues are quite reasonable

Why don't Fescues cost a great deal? Fine Fescues have been around a long time and have been changed very little. Why mess with a good thing? While other former "pasture" species are coming closer to looking like our old standard; receiving notoriety for their "improvements" and enjoy the price increases associated with the word "new," our Fescues have continued what they do best . . . support the up-and-comers. But then, Fine Fescues were meant to be stepped on.

Fine Fescues are Ideal for Recreation, Sports and Leisure

Not only do Fine Fescues excel alone or in perennial ryegrass/Kentucky bluegrass mixtures on horizontal playing surfaces; Fescues are excellent for low maintenance areas like berms, roadside banks, ski slopes and hilly spots that don't retain moisture. So, you see, Fescues are ideal all-around grasses for *all around* your recreation and sports facility. Their low maintenance requirements offer *turf managers* a chance for a little more leisure . . . and there's nothing wrong with that.

For a series of nine tech sheets on Oregon grown Chewings and creeping red Fescues, call or write:

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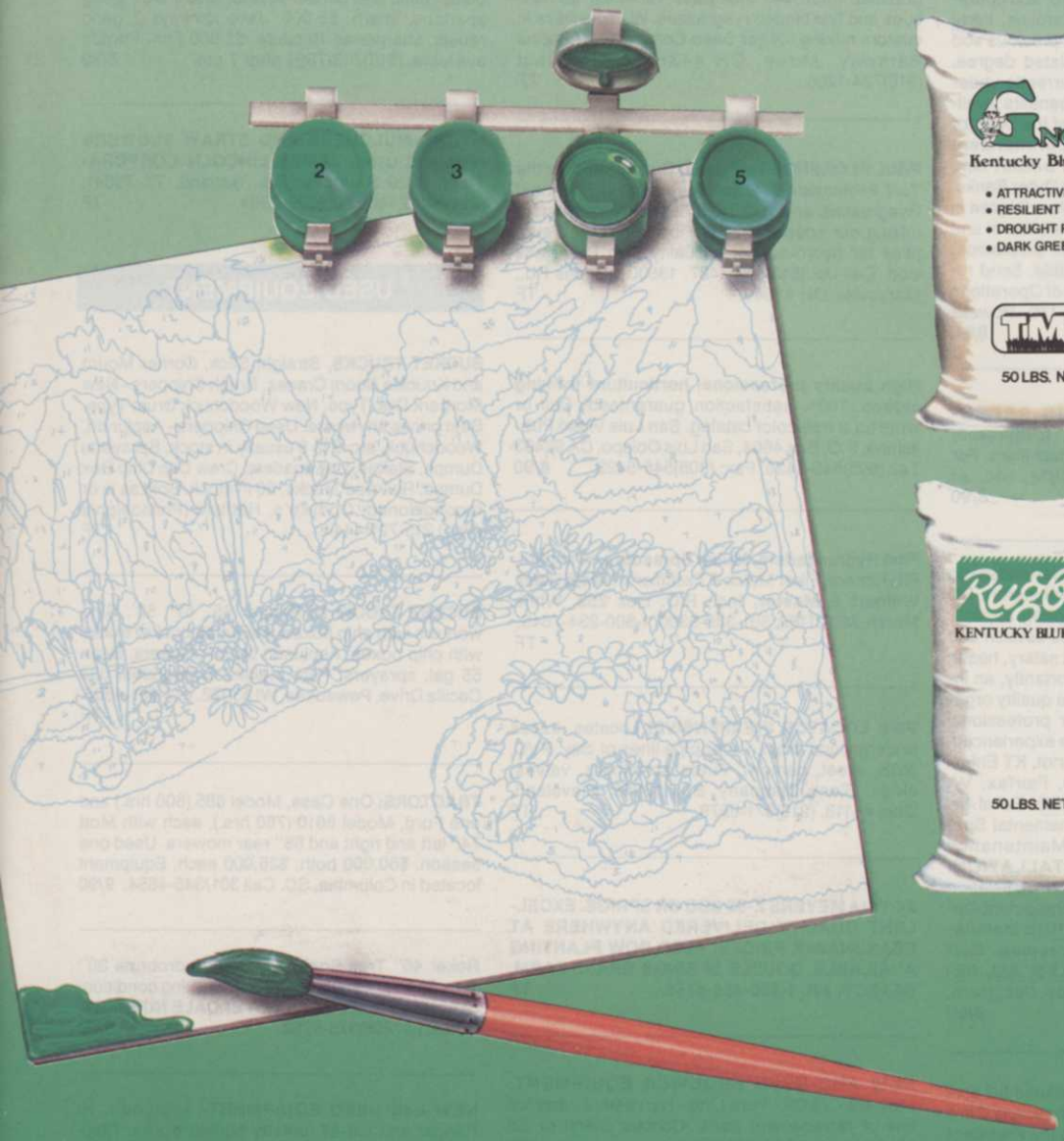

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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Recovering from construction

Problem: *We have some large maple trees damaged by recent road and sidewalk installation. How can we help the trees to recover from this construction damage? Would you recommend drop crotch or thinning out type of pruning to help them? (North Carolina).*

Solution: Generally, correcting construction damage after it is done is difficult, expensive and usually not as successful as pre-construction care. Since you are dealing with already damaged trees, provide a maintenance program including proper fertilizing, watering and pruning. Since the trees are already under severe stress, use fertilizers containing a slow-release, low-burn source of nitrogen. Maintain good moisture content in the soil by proper watering as needed. Deep root watering is preferred.

Any damage to the root system will be reflected in a thinning or dying of the canopy.

Plants affected by construction damage need some pruning to maintain the root-to-shoot ratio. If it is not done plants tend to show dieback like a "self-pruning process." Since we don't know where and how much root is damaged, a light thinning of smaller branches would be beneficial. Remove (thin) the branches which show dieback every year. Schedule to provide a light pruning program for 4-5 years.

Drop crotching or other pruning involving the removal of larger branches is not recommended unless the shape of the tree needs to be maintained. Study the tree's crown and remove any large dead or rubbing branches and maintain the shape. Consider aerifying the area within the dripline to help minimize compaction and fill damage. Drill holes beyond the hard pan, three feet apart, using an auger, and fill it with pea gravel. Use straw to cover the gravel surface and fill the rest of the hole with top soil.

In general, the most successful way to save desirable trees from construction damage is to start proper care and treatment before the actual construction begins.

Transplanting and 'oak wilt'

Problem: *My question concerns "oak wilt" and the correlation, if any, to transplanting. Specifically, I must plant a certain quantity of burr, white, and red oak by May 10 to prevent the onset of this problem. This was related to me by a state forester regarding a project of ours. Is there a correlation between planting date and "oak wilt"? What is the suggested treatment and preventive measures, if any? (Wisconsin)*

Solution: I am not familiar with any documented publications or reports suggesting there is a correlation between planting date and oak wilt disease. Verify the source of state foresters' recommendations for planting burr, white, and red oak by May 10 to prevent the onset of oak wilt.

Although not documented or personally observed, I speculate the following reasons concerning the above recommendation:

1. Plants, particularly oak, with extensive deeper tap root systems, may have a problem of establishing when transplanted after May 10. During the digging and transplanting process, a considerable amount of root injury and loss can occur which affects their recovery and establishment.

2. This transplant shock and slow root development after transplanting may be further aggravated by low moisture content in soil during May, June and later on. This exposes plants to cultural and environmental stress.

3. These stress factors predispose plants to different insect and/or disease problems. If there is an oak wilt affected tree within 40 ft. of newly transplanted oaks, it may get the disease through root graft transmission. However, I am not sure whether younger trees are more or less susceptible to the disease.

4. If there were any open wounds or bark injury during planting, it may attract oak bark beetles *(Scolytidae)* and sap beetles *(Nitdulidae)*, which are the vectors for spreading oak wilt. This is the reason arborists try to avoid pruning oaks during May and June periods.

As far as "suggested treatment," if it is scientifically proven that there is a correlation between transplanting and oak wilt disease spread, then plant oaks at the recommended time.

As far as prevention, the following guidelines might be helpful:

1. If oak wilt is detected, remove the tree promptly.

2. Healthy trees within 40 ft. of diseased trees should be protected from root graft transmission mechanically by trenching or chemically by Vapam treatment of soil 18 inches deep in a line 40 ft. away from the diseased tree. Generally, wait 10 to 12 days after Vapam treatment to remove the diseased trees. Avoid root graft transmission of newly transplanted trees.

3. Avoid pruning or wounding around May and June.

4. Provide an insect management program.

5. Provide good plant health care programs to improve plant vitality.

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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